SAP NetWeaver Composition Environment 7.1 SR5 on AIX: IBM DB2 for z/OS

Production Edition

Target Audience

- Technology consultants
- System administrators

Document version: 1.1 – 05/16/2008
Document History

⚠ Caution
Before you start the implementation, make sure you have the latest version of this document. You can find the latest version at http://www.sdn.sap.com/irj/sdn/nw-ce.

The following table provides an overview of the most important document changes.

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>5/16/2008</td>
<td>Initial Version</td>
</tr>
</tbody>
</table>
# Table of Contents

**Chapter 1**
- **Introduction** .................................................. 7
  - 1.1 How to Use This Guide ........................................... 7
  - 1.2 New Features .................................................. 8
  - 1.3 SAP Notes for the Installation ................................. 11
  - 1.4 Online Information from SAP ................................ 12
  - 1.5 Accessing the SAP Library .................................... 14
  - 1.6 Naming Conventions ............................................ 14

**Chapter 2**
- **Planning** .......................................................... 17
  - 2.1 Installation Options Covered by this Guide .................. 18
  - 2.1.1 Standard System ............................................. 18
  - 2.1.2 High-Availability System ................................... 19
  - 2.1.3 Additional Application Server Instance .................... 20
  - 2.1.4 Standalone Host Agent ..................................... 22
  - 2.2 SAP System Transport Host ................................... 23
  - 2.3 Running Adobe Document Services on Nonsupported Platforms 24
  - 2.4 Integration of LDAP Directory Services ...................... 24
  - 2.5 Implementation Considerations for MCOD ..................... 28
  - 2.6 Installation of Multiple Components in One Database ........ 29
  - 2.7 Planning the Switchover Cluster .............................. 31

**Chapter 3**
- **Preparation** ..................................................... 35
  - 3.1 Basic SAP System Parameters .................................. 36
  - 3.2 Hardware and Software Requirements .......................... 44
  - 3.2.1 Running the Prerequisite Checker in Standalone Mode (Optional) 46
  - 3.2.2 Requirements for AIX ........................................ 47
  - 3.2.3 Requirements for z/OS ....................................... 49
  - 3.2.4 Requirements for DB2 for z/OS ............................... 51
  - 3.2.5 Requirements for a Standard System ......................... 53
  - 3.2.6 Requirements for a High Availability System ................ 54
  - 3.2.6.1 Requirements for a Central Services Instance ............ 55
  - 3.2.6.2 Requirements for an Enqueue Replication Server Instance 56
  - 3.2.6.3 Requirements for the Database Instance ................... 57
  - 3.2.6.4 Requirements for the Primary Application Server Instance 57
  - 3.2.7 Requirements for an Additional Application Server Instance 58
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.8</td>
<td>Requirements for a Standalone Host Agent</td>
<td>59</td>
</tr>
<tr>
<td>3.2.9</td>
<td>Configuring z/OS UNIX System Services</td>
<td>60</td>
</tr>
<tr>
<td>3.2.10</td>
<td>Setting up Swap Space for AIX</td>
<td>61</td>
</tr>
<tr>
<td>3.3</td>
<td>Specifying the Virtual Host Name</td>
<td>92</td>
</tr>
<tr>
<td>3.4</td>
<td>Performing Switchover Preparations for High Availability</td>
<td>62</td>
</tr>
<tr>
<td>3.5</td>
<td>Creating Operating System Users and Groups</td>
<td>62</td>
</tr>
<tr>
<td>3.5.1</td>
<td>Creating AIX Groups and Users (Optional)</td>
<td>65</td>
</tr>
<tr>
<td>3.5.2</td>
<td>Necessary z/OS Group and User IDs</td>
<td>66</td>
</tr>
<tr>
<td>3.6</td>
<td>Preparing User Management for an External ABAP System</td>
<td>68</td>
</tr>
<tr>
<td>3.7</td>
<td>Setting Up File Systems and Raw Devices</td>
<td>71</td>
</tr>
<tr>
<td>3.7.1</td>
<td>SAP Directories</td>
<td>72</td>
</tr>
<tr>
<td>3.7.2</td>
<td>Host Agent Directories</td>
<td>76</td>
</tr>
<tr>
<td>3.7.3</td>
<td>Setting Up File Systems for a High-Availability System</td>
<td>76</td>
</tr>
<tr>
<td>3.7.4</td>
<td>Configuring Network File System for a High-Availability System</td>
<td>78</td>
</tr>
<tr>
<td>3.7.5</td>
<td>Setting Up File Systems and Raw Devices for AIX</td>
<td>80</td>
</tr>
<tr>
<td>3.8</td>
<td>Exporting and Mounting the Global Transport Directory</td>
<td>81</td>
</tr>
<tr>
<td>3.9</td>
<td>Exporting and Mounting Directories via NFS for AIX (Optional)</td>
<td>82</td>
</tr>
<tr>
<td>3.10</td>
<td>Exporting and Mounting Directories via NFS for z/OS</td>
<td>83</td>
</tr>
<tr>
<td>3.11</td>
<td>Generating the SAP Solution Manager Key</td>
<td>83</td>
</tr>
<tr>
<td>3.12</td>
<td>Preparing the Installation DVDs</td>
<td>84</td>
</tr>
<tr>
<td>3.13</td>
<td>Preparing z/OS for SAPinst</td>
<td>87</td>
</tr>
<tr>
<td>4</td>
<td><strong>Installation</strong></td>
<td>89</td>
</tr>
<tr>
<td>4.1</td>
<td>Exporting and Mounting Global Directories</td>
<td>91</td>
</tr>
<tr>
<td>4.2</td>
<td>Specifying the Virtual Host Name</td>
<td>92</td>
</tr>
<tr>
<td>4.3</td>
<td>Running SAPinst</td>
<td>93</td>
</tr>
<tr>
<td>4.4</td>
<td>Performing a Remote Installation with SAPinst (Optional)</td>
<td>99</td>
</tr>
<tr>
<td>4.5</td>
<td>Interrupted Installation with SAPinst</td>
<td>134</td>
</tr>
<tr>
<td>4.6</td>
<td>Starting SAPinst GUI Separately (Optional)</td>
<td>102</td>
</tr>
<tr>
<td>4.7</td>
<td>SAPinst Installation Options</td>
<td>106</td>
</tr>
<tr>
<td>4.8</td>
<td>Installing Additional Components (Optional)</td>
<td>108</td>
</tr>
<tr>
<td>4.9</td>
<td>Installing SAP Memory Analyzer (Optional)</td>
<td>110</td>
</tr>
<tr>
<td>5</td>
<td><strong>Post-Installation</strong></td>
<td>113</td>
</tr>
<tr>
<td>5.1</td>
<td>Logging On to the Application Server</td>
<td>114</td>
</tr>
<tr>
<td>5.2</td>
<td>Ensuring User Security</td>
<td>115</td>
</tr>
<tr>
<td>5.3</td>
<td>Installing the SAP License</td>
<td>117</td>
</tr>
<tr>
<td>5.4</td>
<td>Configuring the Transport Management System</td>
<td>118</td>
</tr>
<tr>
<td>5.5</td>
<td>Configuring the Remote Connection to SAP Support</td>
<td>118</td>
</tr>
<tr>
<td>5.6</td>
<td>Applying the Latest Kernel and Support Packages</td>
<td>118</td>
</tr>
<tr>
<td>5.7</td>
<td>High Availability: Setting Up Licenses</td>
<td>120</td>
</tr>
<tr>
<td>5.8</td>
<td>Post-Installation Steps for the Host Agent</td>
<td>121</td>
</tr>
</tbody>
</table>
5.9 Checking the SAP Java Documentation ................................................................. 121
5.10 CE-Specific Post-Installation Activities ......................................................... 123
5.11 Performing a Full Installation Backup ............................................................. 125
5.12 Post-Installation Steps for the Diagnostics Agent ............................................ 127

Chapter 6

Additional Information ......................................................................................... 129
6.1 Transporting Self-Developed Software Component Archives (SCA) into the System ........................................................................ 129
6.2 Configuration Templates ............................................................................... 130
6.3 Uninstalling SAP NetWeaver Composition Environment ......................... 131
6.4 Mounting a CD / DVD for AIX ..................................................................... 131
6.5 Mounting a CD / DVD on z/OS .................................................................. 132
6.6 Additional Information About SAPInst ......................................................... 134
6.6.1 Interrupted Installation with SAPInst ....................................................... 134
6.6.2 Entries in the Services File Created by SAPInst ......................................... 136
6.6.3 Troubleshooting with SAPInst ................................................................. 137
6.7 Heterogeneous SAP System Installation ...................................................... 137
6.8 Starting and Stopping SAP System Instances .............................................. 138
6.8.1 Starting and Stopping the SAP System Using the SAP Management Console ................................................................. 138
6.8.2 Starting and Stopping the SAP System Using Scripts ............................. 141
6.8.3 Starting and Stopping the Diagnostics Agent Using Scripts ..................... 144
6.9 High Availability: Finalizing the Enqueue Replication Server ..................... 145
6.10 Database Build Phase ................................................................................. 145
6.11 Database Post Load Phase .......................................................................... 148
6.12 saposcl, sapccmsr and SAPCL ................................................................. 148
6.13 Deleting an SAP System ............................................................................. 149
6.14 Deleting the Database Instance ................................................................. 151
1 Introduction

This document explains how to install an SAP NetWeaver Composition Environment system as productive edition.
For more information about SAP NetWeaver Composition Environment, see http://sdn.sap.com/irj/sdn/nw-ce.

Constraints
You need to consider the following constraints before you start your installation:

- You must only use the SAP installation tools according to the instructions and for the purposes described in the SAP installation document. Improper use of the SAP installation tools can damage files and systems already installed.
- SAP system installations should only be performed by SAP Technical Consultants certified for your operating system, your database, and the SAP system that you are installing.
- For downward-compatible releases of DB/OS platforms for SAP products, SAP plans to regularly release the newest database (DB) and operating-system (OS) versions of SAP products. These releases are downward-compatible with earlier SAP system releases.

Note that for already shipped SAP components, we only support the installation for database versions proposed by the installation tool. Therefore, you must install an SAP component or perform a system copy using a downward-compatible database as follows:
- Install the component with the old proposed database version.
- Upgrade the old database version to the downward-compatible new version.

1.1 How to Use This Guide

At the beginning of each installation phase – planning, preparation, installation, and post-installation – you can find a list of the steps that you have to perform in that phase, as well as additional information. Detailed information about the steps for each phase is available in the relevant chapter. When you plan the installation, you have to decide what exactly you want to install, because the steps within each phase vary according to the installation option you choose.

The following installation options are described in this document:

- Standard system (formerly known as central system)
Here you can find the new features in this release.

**Caution**

Make sure that you read the release notes for your SAP system. You can find these at [http://service.sap.com/releasenotes](http://service.sap.com/releasenotes).

### SAP System Installation

#### Area | Description
--- | ---
SAPInst | SAPInst has the following new features:
- The technical terms used for the instances of an SAP system have changed as follows:
  - “Central instance” (CI) is now called “primary application server instance”.
  - “Dialog instance” (DI) is now called “additional application server instance”.
- **Note**
  The technical terms “Database instance”, “Java central services instance” (SCS), and “ABAP central services instance” (ASCS) remain unchanged.
- “Central system” – meaning an SAP system running on one single host – is now called “standard system”.
- You can now install the enqueue replication server (ERS) with SAPInst. There is a new installation option *Enqueue Replication Server Instance* available for the installation options *Distributed System* and *High-Availability System*.
- **Host agent**
  The host agent contains all of the required elements for centrally monitoring any host with the *Alert Monitor* or the *SAP NetWeaver Administrator*. It is automatically installed during the installation of all SAP NetWeaver components, except TREX.
  The host agent is automatically installed with your SAP system.
  You can also install a standalone host agent with SAPInst. There is a new installation option *Host Agent* available under **Software Life-Cycle Options** » **Additional Preparations**. You only need to install a standalone host agent in the following cases:
<table>
<thead>
<tr>
<th>Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Deployment Manager (SDM) no longer available in the Application Server Java</td>
<td>The Software Deployment Manager (SDM) is no longer part of the primary application server instance of a Java-only system. Therefore, there is no longer any technical difference between the primary application server instance and the additional application server instance of a Java-only system. The SAP system directory of both instances is now called J&lt;instance_number&gt;. J&lt;instance_number&gt; no longer exists. For more information, see SAP Directory [page 72].</td>
</tr>
</tbody>
</table>
| Usage type EP Core (EPC)                 | The usage type Enterprise Portal (EP) is divided into the usage types EP Core (EPC) and Enterprise Portal (EP):  
  EP Core (EPC)  
  This usage type contains the core portal capabilities that were available in the former usage type EP. This new usage type provides more flexibility when implementing a portal where the full enterprise portal capabilities, such as knowledge management and collaboration, are not required. It contains the portal, GP, and UWL.  
  Enterprise Portal (EP)  
  This usage type includes Knowledge management, Collaboration, CAF-Core, Visual Composer, Web Dynpro extension, and .NET PDK. Usage type EPC is a prerequisite for usage type EP. If you want to obtain the full capabilities of the former usage type EP, you need both EP Core and EP. The configuration of EPC comprises only portal configuration steps.                                                                                                                                                                                                 |
### Area | Description
--- | ---
**Visual Administrator tool integrated in SAP NetWeaver Administrator** | SAP NetWeaver Administrator is a brand new solution for monitoring and administrating Java systems and their applications. It is a web-based tool for administration, configuration, and monitoring. The Visual Administrator tool is no longer available as a separate tool. It has been integrated in the SAP NetWeaver Administrator. SAP NetWeaver Administrator offers you most of the functions previously available in Visual Administrator, but redesigned for the task-oriented approach of SAP NetWeaver Administrator. For more information about SAP NetWeaver Administrator, see the SAP NetWeaver Master Guide and the following: [http://www.sdn.sap.com/irj/sdn/netweaver](http://www.sdn.sap.com/irj/sdn/netweaver) > Lifecycle Management > Operations > Knowledge Center > Administration.

**SAP Solution Manager Diagnostics Agent** | A SAP Solution Manager Diagnostics Agent (Diagnostics Agent) is a standalone Java program that runs on each of the systems managed by SAP Solution Manager Diagnostics. It gathers information and reports to the SAP Solution Manager system. For more information about the Diagnostics Agent, see [http://service.sap.com/diagnostics](http://service.sap.com/diagnostics). The installation of the Diagnostics Agent is now part of the Installation Master DVD. That is, you can choose between the following options:
- If there is no Diagnostics Agent already installed on this physical or virtual host, it is installed automatically with an AS Java primary application server instance and additional application server instance.
- You can also install it as a standalone engine, for example if you want a non-SAP system to be managed by SAP Solution Manager Diagnostics. The installation of the Diagnostics Agent as a standalone engine is not described in this installation guide, but in the Diagnostics Agent Setup Guide, which is available at [http://service.sap.com/diagnostics](http://service.sap.com/diagnostics).

---

**New Features for SAP on DB2 for z/OS**

<table>
<thead>
<tr>
<th>Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IBM DB2 Version 9.1 for z/OS</strong></td>
<td>SAP kernel 7.10 supports DB2 V9.1 for z/OS, the new database version. DB2 V9.1 for z/OS is capable of implicitly creating databases and tablespaces. However, you can continue using IBM DB2 UDB for z/OS Version 8 with your SAP system. Both versions are referred to as DB2 for z/OS in this documentation.</td>
</tr>
<tr>
<td><strong>IBM DB2 Driver for ODBC and CLI V9</strong></td>
<td>When you install SAP, you do not need to install DB2 Connect, since the IBM DB2 Driver for ODBC and CLI V9 is installed automatically with SAPinst. For more information, see <a href="http://www.sdn.sap.com/irj/sdn/db2">http://www.sdn.sap.com/irj/sdn/db2</a> &gt; SAP on DB2 for z/OS Knowledge Center &gt; SAP Best Practices &gt; Best Practice for Installing or Migrating to DB2 V9.</td>
</tr>
</tbody>
</table>
1.3 SAP Notes for the Installation

You **must** read the following SAP Notes **before** you start the installation. These SAP Notes contain the most recent information on the installation, as well as corrections to the installation documentation. Make sure that you have the up-to-date version of each SAP Note, which you can find at [http://service.sap.com/notes](http://service.sap.com/notes).

### SAP Notes for the Installation

<table>
<thead>
<tr>
<th>SAP Note Number</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>966416</td>
<td>SAP NetWeaver Installation Based on Kernel 7.10: UNIX</td>
<td>UNIX-specific information about the installation for SAP systems based on kernel 7.10 and corrections to this documentation.</td>
</tr>
<tr>
<td>SAP Note Number</td>
<td>Title</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>73606</td>
<td>Supported Languages and Code Pages</td>
<td>Information on possible languages and language combinations in SAP systems</td>
</tr>
<tr>
<td>953763</td>
<td>Installation of SAP NetWeaver Composition Environment 7.1</td>
<td>CE-specific information about the installation and corrections to this documentation.</td>
</tr>
<tr>
<td>956065</td>
<td>SAP NetWeaver Inst. Based On Kernel 7.10: IBM DB2 for z/OS</td>
<td>Platform-specific information about the SAP system installation and corrections to this documentation.</td>
</tr>
<tr>
<td>855498</td>
<td>Installation Prerequisite Checker</td>
<td>SAP Software on UNIX, Windows and System i: Checking OS Dependencies</td>
</tr>
<tr>
<td>73606</td>
<td>Supported Languages and Code Pages</td>
<td>Information on possible languages and language combinations in SAP systems</td>
</tr>
<tr>
<td>1067221</td>
<td>Central Note for Heterogeneous Installation</td>
<td>Heterogeneous ABAP system landscapes on different operating systems have been released for some time. Heterogeneous Java system landscapes on different operating systems have now also been released. However, not every combination of operating system and database system is released. This SAP Note and its related SAP Notes describe the released operating system and database combinations.</td>
</tr>
</tbody>
</table>

### 1.4 Online Information from SAP

More information is available online as follows.

<table>
<thead>
<tr>
<th>Description</th>
<th>Internet Address</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Guide for SAP NetWeaver Composition Environment 7.1</td>
<td><img src="http://sdn.sap.com" alt="http://sdn.sap.com" /></td>
<td>SAP NetWeaver Composition Environment 7.1</td>
</tr>
</tbody>
</table>
### Description

<table>
<thead>
<tr>
<th>Description</th>
<th>Internet Address</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP Security Guide for SAP systems running with IBM DB2 for z/OS (was formerly part of the SAP Planning Guide: DB2 for z/OS)</td>
<td><a href="http://service.sap.com/operationsnwmobile71">http://service.sap.com/operationsnwmobile71</a> Database-Specific Guides</td>
<td>SAP Security Guide for IBM DB2 for z/OS</td>
</tr>
<tr>
<td>You need this guide to install sapccmsr, which is the tool that connects sapcoscl to the SAP application server.</td>
<td><a href="http://service.sap.com/operationsnwmobile71">http://service.sap.com/operationsnwmobile71</a> Monitoring</td>
<td>Monitoring Setup Guide for NW &lt;version&gt;</td>
</tr>
</tbody>
</table>

### General Quick Links

<table>
<thead>
<tr>
<th>Description</th>
<th>Internet Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP on DB2 for z/OS</td>
<td><a href="http://www.sdn.sap.com/irj/sdn/db2">http://www.sdn.sap.com/irj/sdn/db2</a></td>
</tr>
<tr>
<td>SAP Notes</td>
<td><a href="http://service.sap.com/notes">http://service.sap.com/notes</a></td>
</tr>
<tr>
<td>Product Availability Matrix (PAM)</td>
<td><a href="http://service.sap.com/pam">http://service.sap.com/pam</a></td>
</tr>
<tr>
<td>System sizing (Quick Sizer tool)</td>
<td><a href="http://service.sap.com/sizing">http://service.sap.com/sizing</a></td>
</tr>
</tbody>
</table>
### 1.5 Accessing the SAP Library

For more information about SAP NetWeaver, access the SAP Library from the SAP Help Portal at [http://help.sap.com](http://help.sap.com).

The references to SAP NetWeaver Library documentation in this documentation always refer to the following entry point on the SAP Help Portal:

#### 1.6 Naming Conventions

In this documentation, the following naming conventions apply:

**Terminology**

- **SAP system** refers to SAP NetWeaver CE 7.1.
- **Diagnostics Agent** refers to SAP Solution Manager Diagnostics Agent.  

**System User Terminology**

The term **root** is used to signify the installation user in this documentation.

Log on to this user ID whenever **root** is used.

Do not use the **su** command to set **UID = 0**. This does not have the same effect as if you were to set it as the installation user.

For more information about the installation user, see SAP Security Guide for IBM DB2 for z/OS, section **User ID to Install an SAP Central Services Instance on z/OS** on the SAP Service Marketplace at [http://service.sap.com/instguides](http://service.sap.com/instguides).

**IBM Product Terminology**

- **IBM DB2 for z/OS** is referred to as either **DB2 for z/OS** or **DB2**.
- **IBM DB2 Version 9.1 for z/OS** is referred to as **DB2 V9 for z/OS**.
- **DB2 Connect** refers to both the IBM DB2 Driver for ODBC and CLI V9 and the JDBC Driver.
- **IBM DB2 Driver for ODBC and CLI V9** is referred to as **CLI and JDBC Drivers** or **thin client** in the short form.

<table>
<thead>
<tr>
<th>Description</th>
<th>Internet Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP Solution Manager</td>
<td><a href="http://service.sap.com/solutionmanager">http://service.sap.com/solutionmanager</a></td>
</tr>
</tbody>
</table>
SAP on IBM DB2 for z/OS Guide Terminology

- SAP Planning Guide for SAP NetWeaver on IBM DB2 for z/OS
  is referred to as SAP Planning Guide: DB2 for z/OS.
- SAP Database Administration Guide for SAP NetWeaver on IBM DB2 for z/OS
  is referred to as SAP DBA Guide: DB2 for z/OS.

Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;SAPSID&gt;</td>
<td>SAP system ID in uppercase letters</td>
</tr>
<tr>
<td>&lt;sapsid&gt;</td>
<td>SAP system ID in lowercase letters</td>
</tr>
<tr>
<td>&lt;sid&gt; and &lt;sapsid&gt;</td>
<td>SAP system ID in lowercase letters</td>
</tr>
<tr>
<td>&lt;DBSID&gt;</td>
<td>Database ID in uppercase letters</td>
</tr>
<tr>
<td>&lt;dbsid&gt;</td>
<td>Database ID in lowercase letters</td>
</tr>
<tr>
<td>&lt;host_name&gt;</td>
<td>Name of the corresponding host</td>
</tr>
<tr>
<td>&lt;user_home&gt;</td>
<td>Home directory of the user performing the installation.</td>
</tr>
<tr>
<td>&lt;INSTDIR&gt;</td>
<td>Installation directory for the SAP system</td>
</tr>
<tr>
<td>&lt;DVD_DIR&gt;</td>
<td>Directory on which a DVD is mounted</td>
</tr>
<tr>
<td>&lt;OS&gt;</td>
<td>Operating system name within a path</td>
</tr>
<tr>
<td>&lt;SCHEMAID&gt;</td>
<td>Database schema ID</td>
</tr>
</tbody>
</table>

The following example shows how the variables are used:

Example

Log on as user <sapsid>adm and change to the directory /usr/sap/<SAPSID>.
If your SAP system ID is C11, log on as user c11adm and change to the directory /usr/sap/C11.
This page is intentionally left blank.
2 Planning

This section provides general planning information.

You must first:

1. Plan your SAP system landscape according to the Master Guide and the Technical Infrastructure Guide available for your product.
2. Decide on your installation option [page 18].

Now continue with the section for your chosen installation option below.

Standard, Distributed, or High-Availability System

Note
Since an SAP on IBM DB2 for z/OS system is always a distributed constellation, we only offer a standard or high-availability installation option.

1. You decide on the transport host to use [page 23].
2. If you want to use Adobe Document Services (ADS), you check what you have to do if your platform is not supported for ADS [page 24].
3. You read through the implementation considerations for MCOD [page 28].
4. You decide whether you want to install multiple components in one database (MCOD) [page 29]

5. If you want to install a high-availability system, you read Planning the Switchover Cluster [page 31].

6. You can now continue with Preparation [page 35].

Additional Application Server Instance

You do not have to perform any planning steps.
You can immediately continue with Preparation [page 35].

Host Agent as a Standalone Installation

You do not have to perform any planning steps.
You can immediately continue with Preparation [page 35].
2.1 Installation Options Covered by this Guide

This section shows the installation options covered by this installation guide.

- **Standard system** [page 18] (formerly known as central system)
  
  Only valid for: HA (UNIX)

- **High-availability system** [page 19]
  
  End of: HA (UNIX)

- You can install one to <n> additional application server instance(s) [page 20] to an existing standard or high-availability system.
- You can install a standalone host agent [page 22].

### 2.1.1 Standard System

In a standard system, your primary application server instance runs on Linux, UNIX or Windows, and your database host on z/OS. The ASCS and SCS instances may run on any of these operating system hosts, however we recommend you install them on z/OS.

For more information, see [High-Availability System](#) [page 19].

The following figure shows an example of SAP instances in a standard (central) system, where the mandatory instances are all installed on one host, except for the database instance, which is on System z:

**Figure 1:** Standard Java System IBM DB2 for z/OS
Optionally you can install one or more additional application server instances. For more information, see Additional Application Server Instance [page 20].

Only valid for: HA (UNIX)

### 2.1.2 High-Availability System

In a high-availability system, every instance can run on a separate host:

- Java Central Services Instance (SCS)
- Database instance
- Primary application server instance

We recommend that you run both the ASCS and the SCS in a switchover cluster infrastructure. Both the ASCS and the SCS must each have their own Enqueue Replication Server (ERS) instance. Optionally you can install one to <n> additional application server instances. For more information, see Installation of an Additional Application Server Instance [page 20].

---

**Recommendation**

We recommend that you install the ASCS and SCS instances on z/OS in a high-availability system. For more information, see the SAP Planning Guide: DB2 for z/OS.

The following figures show examples for the distribution of the SAP instances in a high-availability system.
2.1.3 Additional Application Server Instance

You can install one or more additional application server instance(s) for an existing SAP system. An additional application server instance can run on a dedicated host.

**Note**

If you want to install additional application server instances running on another operating system than the primary application server instance, for example if your primary application server instance runs on Solaris, but the additional application server instances shall run on Windows, see *Heterogeneous SAP System Installation* [page 137].

**Additional Application Server Instance for a Standard System**

The following figure shows three additional application server instances running on a dedicated host. For additional information, see *Standard System* [page 18].
Figure 3: Additional Application Server Instance for a Standard System – IBM DB2 for z/OS

Additional Application Server Instance for a High-Availability System

The following figure shows three additional application server instances running on a dedicated host in a high-availability system.

It is not recommended to install additional application server instance(s) on the switchover cluster infrastructure.
### 2.1.4 Standalone Host Agent

Using the host agent you can centrally monitor any host with the Alert Monitor or the SAP NetWeaver Administrator or the Adaptive Computing Controller (ACC). In addition, the host agent is used by the ACC for starting, stopping, and relocating SAP instances and databases. For more information on the ACC see [http://sdn.sap.com/irj/sdn/adaptive](http://sdn.sap.com/irj/sdn/adaptive). The host agent is automatically installed during the installation of all SAP NetWeaver instances and components.

You only need to install a **standalone** host agent in the following cases:

- You want to manage a host that does not have an SAP instance or component.
- You have upgraded your SAP system to SAP NetWeaver 7.1 or higher and want to the instances of the upgraded system to be managed by the ACC.
The host agents contain the following elements:

- The control program saphostexec
- The SAP NetWeaver Management agent SAPHostControl (sapstartsrv in host mode)
- The sapacosprep executable of the Adaptive Computing Infrastructure
- The operating system collector saposcol

**Note**

The installed programs are automatically started when the host is booted. The automatic start is ensured by the startup script `sapinit` that starts the required executables.

**More Information**

For more information about the host agent, see the SAP Library [page 14]:

Function-Oriented View ➤ Application Server ABAP ➤ Administration Tools for AS ABAP ➤ Monitoring in the CCMS ➤ Infrastructure of the NetWeaver Management Agents ➤

### 2.2 SAP System Transport Host

The transport host contains the transport directory that is used by the SAP transport system to store transport data and change information of SAP systems, such as software programs, data dictionary data, or customization data. If you have several SAP systems they are usually organized in transport domains. In most cases, all SAP systems in a transport domain have a common transport directory.
For more information, see the SAP Library [page 14]:

- Administrator’s Guide
- Technical Operations Manual
- General Administration Tasks
- Software Life Cycle Management
- Software Logistics
- Change and Transport System
- Change and Transport System — Overview (BC-CTS)
- Basics of the Change and Transport System
- Transport Management System — Concept

When you install an SAP system, SAPinst by default creates the transport directory on the primary application server instance host in `/usr/sap/trans`. You have to prepare this host for use by the new SAP system if one of the following applies to you:

- You want to locate the transport directory on another host.
- You want to use an existing transport host and directory in your SAP system landscape.

For more information, see Exporting and Mounting the Global Transport Directory [page 81].

More Information

Setting Up File Systems and Raw Devices [page 71]

2.3 Running Adobe Document Services on Nonsupported Platforms

Adobe document services (ADS) are currently not supported to run natively on all platforms supported by SAP systems based on SAP NetWeaver, in particular on 64-bit platforms.

Procedure

To use ADS in SAP landscapes on nonsupported platforms, install an additional standalone AS Java on a platform supported by ADS.

For more information, see SAP Note 925741.

More Information

For more information about running ADS on SAP systems based on SAP NetWeaver, see http://sdn.sap.com/irj/sdn/adobe.

2.4 Integration of LDAP Directory Services

This section explains the benefits of using the SAP system with the Lightweight Directory Access Protocol (LDAP) directory and gives an overview of the configuration steps required to use an SAP system with the directory.

LDAP defines a standard protocol for accessing directory services, which is supported by various directory products such as Microsoft Active Directory, and OpenLDAP `slapd`. Using directory services enables important information in a corporate network to be stored centrally on a server. The
advantage of storing information centrally for the entire network is that you only have to maintain data once, which avoids redundancy and inconsistency.

If an LDAP directory is available in your corporate network, you can configure the SAP system to use this feature. For example, a correctly configured SAP system can read information from the directory and also store information there.

**Note**
The SAP system can interact with the Active Directory using the LDAP protocol, which defines:

- The communication protocol between the SAP system and the directory
- How data in the directory is structured, accessed, or modified

If a directory other than the Active Directory also supports the LDAP protocol, the SAP system can take advantage of the information stored there. For example, if there is an LDAP directory on a UNIX or Windows server, you can configure the SAP system to use the information available there. In the following text, directories other than the Active Directory that implement the LDAP protocol are called **generic LDAP directories**.

**Caution**
This section does not provide information about the use of LDAP directories with the LDAP Connector. For more information about using and configuring the LDAP Connector for an ABAP system, see the SAP Library [page 14]:

- Function-Oriented View
- Security
- Identity Management
- Identity Management of the Application Server ABAP
- Configuration of Identity Management
- Directory Services
- LDAP Connector

**Prerequisites**
You can only configure the SAP system for Active Directory services or other LDAP directories if these are already available on the network. As of Windows 2000 or higher, the Active Directory is automatically available on all domain controllers. A generic LDAP directory is an additional component that you must install separately on a UNIX or Windows server.

**Features**
In the SAP environment, you can exploit the information stored in an Active Directory or generic LDAP directory by using:

- SAP Logon
- The SAP Microsoft Management Console (SAP MMC)
- The SAP Management Console (SAP MC)

For more information about the automatic registration of SAP components in LDAP directories and the benefits of using it in SAP Logon and SAP MMC, see the documentation SAP System Information in Directory Services on SAP Service Marketplace at:

- [http://service.sap.com/msplatforms](http://service.sap.com/msplatforms)
- Microsoft
- Windows Server
For more information about the SAP MC and about how to configure it to access LDAP Directories, see the documentation SAP Management Console in the SAP Library [page 14]:


SAP Logon

Instead of using a fixed list of systems and message servers, you can configure SAP Logon in the sapmsg.ini configuration file to find SAP systems and their message servers from the directory. If you configure SAP logon to use the LDAP directory, it queries the directory each time Server or Group selection is chosen to fetch up-to-date information on available SAP systems.

To use LDAP operation mode, make sure that the sapmsg.ini file contains the following:

```
[Address]
Mode=LDAPdirectory
LDAPserver= pcintel6
LDAPnode=
LDAPoptions=
```

Distinguish the following cases:

- If you use an Active Directory, you must set LDAPoptions="DirType=NT5ADS". For more information, see the SAP system profile parameter 1dap/options.
- You must specify the directory servers (for example, LDAPserver=pcintel16 p24709) if either of the following is true:
  - The client is not located in the same domain forest as the Active Directory
  - The operating system does not have a directory service client (Windows NT and Windows 9X without installed dsclent).

    For more information, see the SAP system profile parameter 1dap/servers.
- For other directory services, you can use LDAPnode to specify the distinguished name of the SAP root node. For more information, see the SAP system profile parameter 1dap/saproot.

SAP MMC

The SAP MMC is a graphical user interface (GUI) for administering and monitoring SAP systems from a central location. It is automatically set up when you install an SAP system on Windows. If the SAP system has been prepared correctly, the SAP MMC presents and analyzes system information that it gathers from various sources, including the Active Directory.

Integrating the Active Directory as a source of information has advantages for the SAP MMC. It can read system information straight from the directory that automatically registers changes to the system landscape. As a result, up-to-date information about all SAP application servers, their status, and parameter settings is always available in the SAP MMC.

If your SAP system is part of a heterogeneous SAP system landscape that comprises systems or instances both on Unix and Windows operating systems, you can also use the SAP MMC for operating and monitoring the instances running on Unix.
SAP MC
The SAP MC is a graphical user interface (GUI) for administering and monitoring SAP systems from a central location. The SAP MC is automatically set up when you install an SAP system on any platform. If the SAP system has been prepared correctly, the SAP MC presents and analyzes system information that it gathers from various sources, including a generic LDAP Directory. Integrating a generic LDAP Directory as a source of information has advantages for the SAP MC. It can read system information straight from the directory that automatically registers changes to the system landscape. As a result, up-to-date information about all SAP application servers, their status, and parameter settings is always available in the SAP MC.

Configuration Tasks for LDAP Directories
This section describes the configuration tasks you have to perform for the Active Directory or other (generic) LDAP directories.

Configuration Tasks for Active Directory
To enable an SAP system to use the features offered by the Active Directory, you must configure the Active Directory so that it can store SAP system data.
To prepare the directory, you use SAPinst to automatically:
- Extend the Active Directory schema to include the SAP-specific data types
- Create the domain accounts required to enable the SAP system to access and modify the Active Directory. These are the group SAP_LDAP and the user sap1dap.
- Create the root container where information related to SAP is stored
- Control access to the container for SAP data by giving members of the SAP_LDAP group permission to read and write to the directory
You do this by running SAPinst on the Windows server on which you want to use Active Directory Services and choosing GUI <SAP System> > Software Life-Cycle Options > LDAP Registration > Active Directory Configuration ➤. For more information about running SAPinst on Windows, see documentation Installation Guide — <your product> on Windows : <Database>.

Note
You have to perform the directory server configuration only once. Then all SAP systems that need to register in this directory server can use this setup.

Configuration Tasks for Generic LDAP Directories
To configure other LDAP directories, refer to the documentation of your directory vendor.

Enabling the SAP System LDAP Registration
Once you have correctly configured your directory server, you can enable the LDAP registration of the SAP system by setting some profile parameters in the default profile.
To do this, run SAPinst [page 93] once for your system and choose:
If you use a directory server other than Microsoft Active Directory and/or non-Windows application servers, you have to store the directory user and password information by using `ldappasswd pf=<any_instance_profile>`. The information is encrypted for storage in `DIR_GLOBAL` and is therefore valid for all application servers. After restarting all application servers and start services, the system is registered in your directory server. The registration protocols of the components are `dev_ldap*`. The registration is updated every time a component starts.

### 2.5 Implementation Considerations for MCOD

As described in *Installation of Multiple Components in One Database* [page 29], you can install additional components on one database.
The following sections provide an overview of the changes that enable the installation of multiple components in one database.

#### Different Schema for Database Objects

To separate the different components in the DB2 subsystem, the database objects are owned by a component-specific authorization ID that is called `creator` or `schema` (these terms are identical). The default authorization ID used for both MCOD and non-MCOD installations is `SAPR3`.

All database objects independent of whether they are installed as an additional or as the first component in the database subsystem are created by the authorization ID specified as `schema`. Make sure that all of the components use a different `schema`.

![Recommendation](image)

[Recommendation]

We recommend that you use the `SAP<SAPSID>` of the corresponding component, for example, `SAPD6Z`.

During the installation SAPinst sets an additional environment variable and profile parameter to the schema name as follows:

- `dbs_db2_schema` (environment variable)
- `dbs/db2/schema` (profile parameter)

#### RACF Considerations

Since additional authorization IDs are used in an MCOD landscape, you have to make sure that each schema used in your MCOD landscape is defined as a secondary authorization ID.

For more information, see the *SAP Security Guide for IBM DB2 for z/OS*.

#### Different Naming Convention for DB2 Stgroups – DB2 V8

A stgroup name in a DB2 subsystem **must** be unique, even if the stgroups for additional components have a different owner.
There is an additional naming convention for the storage groups as follows:

- `<SID><STOGROUP_ID>D`
- `<SID><STOGROUP_ID>I`

`<STOGROUP_ID>` is related to the table category, for example, LD for category LOAD.

**Example**

- Stogroup name for the master system (table category LOAD): `SAPLDD` and `SAPLDI`
- Stogroup name for additional components (table category LOAD, the schema used is `SAPD6Z` and the `<SID>` D6Z): `D6ZLDD` and `D6ZLDI`

**Different Naming Convention for DB2 Stogroups – DB2 V9**

DB2 V9 creates tablespaces and stogroups implicitly in DB2. Therefore, as of DB2 V9 there is only one default stogroup: `SYSDEFLT`.

## 2.6 Installation of Multiple Components in One Database

You can install **multiple** SAP systems in a **single** database. This is called Multiple Components in One Database (MCOD).

MCOD is available with all SAP components. This technology is available on all the major databases for the SAP system, in line with our commitment to deliver platform-independent solutions.

Using this technology is as easy as installing a separate component. No extra effort is required because the MCOD installation is fully integrated into the standard installation procedure. MCOD is not an additional installation option. Instead, it is an option of the database instance installation.

There are two MCOD scenarios:

- The installation of an SAP system in a new database
- The installation of an additional SAP system in an existing database

**Prerequisites**

- For about MCOD and its availability on different platforms, see [http://service.sap.com/mcod](http://service.sap.com/mcod).
- Since SAP does not support mixed solutions with MCOD, your SAP system must contain Unicode SAP instances only.
- Improved sizing required

  In general, you calculate the CPU usage for an MCOD database by adding up the CPU usage for each individual SAP system. You can do the same for memory resources and disk space.
You can size multiple components in one database by sizing each individual component using the SAP Quick Sizer and then adding the requirements together. For about the SAP Quick Sizer, see http://service.sap.com/sizing.

**Features**

- Reduced administration effort
- Consistent system landscape for backup, system copy, administration, and recovery
- Increased security and reduced database failure for multiple SAP systems due to monitoring and administration of only one database
- Independent upgrade
  
  In an MCOD landscape, you can upgrade a single component independently from the other components running in the same database, assuming that the upgraded component runs on the same database version. However, if you need to restore a backup, be aware that all other components are also affected.

**Note**

Special MCOD considerations and differences from the standard procedure are listed where relevant in the installation documentation.

**Constraints**

- **We strongly recommend** that you test MCOD in a test or development system. We recommend that you run MCOD systems in the same context. We do not recommend that you mix test, development, and production systems in the same MCOD.
- In the event of database failure, all SAP systems running on the single database are affected.
- Automated support in an MCOD landscape for the following administrative tasks depends on your operating system and database:
  - Copying a single component from an MCOD landscape to another database at database level.
  - De-installing a single component from an MCOD landscape requires some additional steps.
  
  You can use a remote connection to SAP support to request help with these tasks. For more information, see http://service.sap.com/remoteconnection.
- When you use stopsap in an MCOD system with two primary application server instances, only one primary application server instance is stopped. Therefore, you must first stop the other SAP system with stopsap R3 to make sure that the database is also stopped.
- For the first SAP system, the database system ID can be different from the SAP system ID.
- For the second SAP system, you must use the same DBSID as for the first SAP system.
- If you decide to turn off database logging during the database load phase of the installation, you need to plan downtime for all MCOD systems sharing the database.
2.7 Planning the Switchover Cluster

You can reduce unplanned downtime for your SAP system by setting up a switchover cluster. This setup installs critical software units – known as “single points of failure” (SPOFs) – across multiple host machines in the cluster. In the event of a failure on the primary node, proprietary switchover software automatically switches the failed software unit to another hardware node in the cluster. Manual intervention is not required. Applications accessing the failed software unit might experience a short delay but can then resume processing as normal.

Switchover clusters also have the advantage that you can deliberately initiate switchover to free up a particular node for planned system maintenance. Switchover solutions can protect against hardware failure and operating system failure but not against human error, such as operator errors or faulty application software. Additional downtime might be caused by upgrading your SAP system or applying patches to it.

Without a switchover cluster, the SAP system SPOFs – central services instance, the database instance, and the central file share – are vulnerable to failure because they cannot be replicated. All of these can only exist once in a normal SAP system.

You can protect software units that are not SPOFs against failure by making them redundant, which means simply installing multiple instances. For example, you can add additional application server instances. This complements the switchover solution and is an essential part of building HA into your SAP system.

**Recommendation**

We recommend switchover clusters to improve the availability of your SAP system.

A switchover cluster consists of:

- A hardware cluster of two or more physically separate host machines to run multiple copies of the critical software units, in an SAP system the SPOFs referred to above
- Switchover software to detect failure in a node and switch the affected software unit to the standby node, where it can continue operating
- A mechanism to enable application software to seamlessly continue working with the switched software unit – normally this is achieved by virtual addressing (although identity switchover is also possible)

**Prerequisites**

You must first discuss switchover clusters with your hardware partner because this is a complex technical area. In particular, you need to choose a proprietary switchover product that works with your operating system.
We recommend that you read the following documentation before you start:

- Check the informations and the installation guides that are available at [http://sdn.sap.com/irj/sdn/ha](http://sdn.sap.com/irj/sdn/ha).
- The enqueue replication server (ERS) is a major contribution to an HA setup and is essential for a Java system. We strongly recommend you to also use it for an ABAP system. You need one ERS for each Java SCS and one ERS for each ABAP SCS (ASCS) installed in your system.
- For more information about a high-availability installation for an SAP system on IBM DB2 for z/OS, see SAP Planning Guide: DB2 for z/OS on the SAP Service Marketplace.

### Features
The following graphic shows the essential features of a switchover setup:

**Figure 6: Switchover Setup**

![Switchover Setup Diagram]

**Note**
This graphic and the graphics in this section are only examples. You need to discuss your individual HA setup with your HA partner.

These graphics summarize the overall setup and do not show the exact constellation for an installation based on one of the available technologies (ABAP, ABAP+Java, or Java).

The following graphic shows an example of a switchover cluster in more detail:
Figure 7: Switchover Cluster

Constraints
This documentation concentrates on the switchover solution for the central services instance. For more information about how to protect the Network File System (NFS) software and the database instance by using switchover software or (for of the database) replicated database servers, contact your HA partner.

You need to make sure that your hardware is powerful enough and your configuration is robust enough to handle the increased workload after a switchover. Some reduction in performance might be acceptable after an emergency. However, it is not acceptable if the system comes to a standstill because it is overloaded after switchover.

End of: HA (UNIX)
This page is intentionally left blank.
3 Preparation

This section includes the preparation steps that you have to perform for the:

- Standard or high-availability system
- Additional application server instance
- Standalone host agent

Preparation Steps for a Standard, Distributed, or High-Availability System

Note
Since an SAP on IBM DB2 for z/OS system is always a distributed constellation, we only offer a standard or high-availability installation option.

1. You identify basic SAP system parameters [page 36].
2. You check the hardware and software requirements [page 44] for every installation host of the HA system landscape that you want to install.
3. You make sure that the required operating system users and groups [page 62] are created.
4. If you want to configure the User Management Engine (UME) of Application Server Java (AS Java) for the user management of a separate ABAP system, you have to prepare user management for an external ABAP System [page 68].
5. You set up file systems and raw devices [page 71] and make sure that the required disk space is available for the directories to be created during the installation.
6. If you want to share the transport directory transaction from another system, export [page 81] this directory to your installation hosts.
7. If you want to use virtual host names, you have to set the environment variable SAPINST_USE_HOSTNAME [page 92]. Alternatively you can specify the virtual host name in the command to start SAPinst.

8. If you want to install a high-availability system, you perform switchover preparations [page 62].

9. You generate the SAP Solution Manager Key [page 83].
10. You make sure that the required installation media [page 84] are available on every host on which you want to install an instance of your SAP system.
11. You can continue with Installation [page 89].
Preparation Steps for an Additional Application Server Instance

You have to perform the following preparations on the host where you install the additional application server instance(s):

1. You identify basic SAP system parameters [page 36].
2. You check the hardware and software requirements [page 44] for every installation host on which you want to install one or more additional application server instances.
3. You make sure that the required operating system users and groups [page 62] are created.
4. You set up file systems and raw devices [page 71] and make sure that the required disk space is available for the directories to be created during the installation.
5. If you want to share the transport directory trans from another system, export [page 81] this directory to your installation hosts.
6. If you want to use a virtual host name, you have to set the environment variable SAPINST_USE_HOSTNAME [page 92]. Alternatively you can specify the virtual host name in the command to start SAPinst.
7. You make sure that the required installation media [page 84] are available on every host on which you want to install one or more additional application server instances.
8. You can continue with Installation [page 89].

Preparation Steps for a Standalone Host Agent

You have to perform the following preparations on the host where you install a standalone host agent:

1. You identify basic SAP system parameters [page 36].
   You can find the parameters in the table Host Agent.
2. You check the hardware and software requirements [page 44] on the installation host.
   You can find the requirements for the Host Agent in section Requirements for a Standalone Host Agent.
3. You make sure that the required operating system users and groups [page 62] are created.
   You can find the operating system user for the Host Agent in the tables User and Groups of the Standalone Host Agent and Groups and Members of the Standalone Host Agent User.
4. You set up file systems and raw devices [page 71] and make sure that the required disk space is available for the directories to be created during the installation.
   You can find the directories for the Host Agent in section Host Agent Directories
5. You make sure that the required installation media [page 84] are available on the installation host.
   You can find the installation media that are required for the installation of a standalone host agent in the row Host Agent (Standalone) of the media table.
6. You can continue with Installation [page 89].

3.1 Basic SAP System Parameters

SAPinst asks whether you want to run the installation in Typical or Custom mode.
If you choose *Typical*, SAPinst provides automatic default settings and you only have to respond to a minimum number of prompts. However, you can still change any of the default settings on the parameter summary screen.

The tables below list the basic system parameters that you always need to specify before installing your SAP system, both in typical and in custom mode.

For all other SAP system parameters, use the [Help] help in the SAPinst dialogs.

**SAP System ID and Database ID**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP System ID &lt;SAPSID&gt;</td>
<td>The SAP system ID &lt;SAPSID&gt; identifies the entire SAP system. SAPinst prompts you for the &lt;SAPSID&gt; when you execute the <em>first</em> installation option to install a new SAP system. If there are further installation options to be executed, SAPinst prompts you for the profile directory. For more information, see the description of the parameter <em>SAP System Profile Directory</em>.</td>
</tr>
<tr>
<td></td>
<td><strong>Example</strong></td>
</tr>
<tr>
<td></td>
<td>This prompt appears when you install the central services instance, which is the first instance to be installed in a distributed system.</td>
</tr>
<tr>
<td></td>
<td><strong>Caution</strong></td>
</tr>
<tr>
<td></td>
<td>Choose your SAP system ID carefully. Renaming is difficult and requires you to reinstall the SAP system.</td>
</tr>
<tr>
<td>Make sure that your SAP system ID:</td>
<td></td>
</tr>
<tr>
<td>□ Is unique throughout your organization</td>
<td></td>
</tr>
<tr>
<td>□ Consists of exactly three alphanumeric characters</td>
<td></td>
</tr>
<tr>
<td>□ Contains only uppercase letters</td>
<td></td>
</tr>
<tr>
<td>□ Has a letter for the first character</td>
<td></td>
</tr>
<tr>
<td>□ Does not include any of the following, which are reserved IDs:</td>
<td></td>
</tr>
<tr>
<td>ADD ALL AND ANY ASC AUX COM CON DBA END EPS FOR GID IBM INT KEY LOG LPT MON NIX NOT NUL OFF OMS PRN RAW ROW SAP SET SGA SHG SID SQL SYS TMP UID USR VAR</td>
<td></td>
</tr>
<tr>
<td>System ID &lt;SMDSID&gt; of SAP Solution Manager Diagnostics Agent</td>
<td>SAPinst sets &lt;SMDSID&gt; to SMD by default. If SMD is already used by another SAP system that is not a Diagnostics Agent system, &lt;SMDSID&gt; is set to DA&lt;&gt;, where &lt;&gt; can be any letter from A to Z, and DA stands for “DiagnosticsAgent”). If required, you can change &lt;SMDSID&gt; to a value of your choice on the Parameter Summary screen. If you do so, the same naming conventions as for &lt;SAPSID&gt; apply. For more information, see entry “SAP System ID &lt;SAPSID&gt;” in this table above.</td>
</tr>
</tbody>
</table>
### SAP System Profile Directory

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>/&lt;sapmnt&gt;/&lt;SAPSID&gt;/profile</code> or <code>/usr/sap/&lt;SAPSID&gt;/SYS/profile</code></td>
<td>The installation retrieves the parameters entered earlier from the SAP system profile directory. SAPinst prompts you to enter the location of the profile directory when the installation option that you execute is not the first one belonging to your SAP system installation. See also the description of the parameters <code>SAP System ID</code> and <code>Database ID</code>. <code>/usr/sap/&lt;SAPSID&gt;/SYS/profile</code> is the soft link referring to <code>/&lt;sapmnt&gt;/&lt;SAPSID&gt;/profile</code>.</td>
</tr>
</tbody>
</table>

**Note**

If you install an additional application server instance in an existing SAP system, SAPinst also prompts you for the profile directory of the existing SAP system.

### SAP System Instances, Hosts, and Ports

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
</table>
| Instance Number of the SAP system | **Instance Number:**
Technical identifier that is required for every instance of an SAP system, consisting of a two-digit number from 00 to 97.
The instance number must be unique on a host. That is, if more than one SAP instance is running on the same host, these instances must be assigned different numbers.
The instance number is used to specify the names of the SAP system instance directories which are created automatically by SAPinst during the installation:
- The directory both of the primary application server instance and of an additional application server instance is called `<Instance_Number>`.
- The directory of the central services instance is called `SCS<Instance_Number>`.
- The directory of the Enqueue Replication Server instance is called `ERS<Instance_Number>`.

Only valid for: HA (UNIX)

End of: HA (UNIX)

For more information, see *SAP Directories* [page 72].

**Caution**

Make sure that you know the value of your DB2 Connect port before you choose your SCS instance number (if you are installing a Java or ABAP+Java system). The DB2 Connect port has a default of `50000`. The Java Engine port is `5<SCS instance number>00`.
For example, if the DB2 Connect port had the default value, and you chose `00` to be your SCS instance number, this causes a conflict. The value of the DB2 Connect port can be found in the `/etc/services` file.
### 3.1 Basic SAP System Parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instance Number for the Diagnostics Agent</td>
<td>Technical identifier for internal processes for the Diagnostics Agent, consisting of a two-digit number from 00 to 98.</td>
</tr>
<tr>
<td></td>
<td>The instance number is set automatically to the next free and valid instance number that has not yet been assigned to the SAP system.</td>
</tr>
<tr>
<td></td>
<td>The instance number is used to specify the name of the Diagnostics Agent instance directory which are created automatically by SAPInst during the installation:</td>
</tr>
<tr>
<td></td>
<td>The directory of the Diagnostics Agent instance is called J&lt;Instance_Number&gt;.</td>
</tr>
<tr>
<td></td>
<td>For more information, see SAP Directories [page 72].</td>
</tr>
<tr>
<td></td>
<td>The same restrictions apply as in “Instance Number of the SAP system” (see above).</td>
</tr>
<tr>
<td>Virtual Host Name</td>
<td>You can use one or more virtual TCP/IP host names for SAP servers within an SAP server landscape to order to conceal their physical network identities from each other. This may be useful when moving SAP servers or complete server landscapes to other new hardware within a short time frame without having to carry out a reinstallation or complicated reconfiguration.</td>
</tr>
<tr>
<td></td>
<td>If you want to use virtual host names for the installation, you have to specify the virtual host name [page 92] before you start SAPInst.</td>
</tr>
<tr>
<td></td>
<td>[Only valid for: HA (UNIX)]</td>
</tr>
<tr>
<td></td>
<td>If you want to install a high-availability (HA) system [page 19], you need the virtual host name when you install the SCS instance into a cluster.</td>
</tr>
<tr>
<td></td>
<td>[End of: HA (UNIX)]</td>
</tr>
<tr>
<td></td>
<td>For more information about the use of virtual TCP/IP host names, see SAP Note 962955.</td>
</tr>
<tr>
<td></td>
<td>The host name must not exceed 12 characters. For more information about the allowed host name length and characters, see SAP Note 611361.</td>
</tr>
<tr>
<td>Message Server Port</td>
<td><img src="image" alt="Caution" /></td>
</tr>
<tr>
<td></td>
<td>The message server port number must be unique for the SAP system on all hosts. If there are several message port numbers on one host, all must be unique.</td>
</tr>
<tr>
<td></td>
<td><strong>Port Number of the SAP Message Server:</strong></td>
</tr>
<tr>
<td></td>
<td>If you do not specify a value, the default port number is used.</td>
</tr>
<tr>
<td></td>
<td>The SCS instance profile contains the configuration for the Java message server.</td>
</tr>
<tr>
<td></td>
<td>The Java message server port uses the parameter <code>rdisp/msserv_internal</code> with default value <code>39&lt;nn&gt;</code>, where <code>&lt;nn&gt;</code> is the instance number of the SCS message server instance.</td>
</tr>
<tr>
<td></td>
<td>For more information about the parameters used for message server ports, see SAP Note 821875.</td>
</tr>
</tbody>
</table>
Master Password

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Password</td>
<td>This password is used for all new user accounts SAPinst creates and for the secure store key phrase. The length has to be 8 to 14 characters. Depending on your installation scenario there might be more restrictions.</td>
</tr>
</tbody>
</table>

⚠️ Caution

If you do not create the operating system users manually, SAPinst creates them with the common master password. For more information, see the description of the parameter Operating System Users. In this case, make sure that the master password meets the requirements of your operating system and of your database.

Operating System Users of the SAP System

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>User &lt;sapsid&gt;adm</td>
<td>User &lt;sapsid&gt;adm is the system administrator user. If you did not create user &lt;sapsid&gt;adm manually before the installation, SAPinst creates it automatically during the installation. SAPinst sets the Master Password by default, but you can overwrite it either by choosing parameter mode Custom or by changing it on the parameter summary screen. Make sure that the user ID and group ID of this operating system user are unique and the same on each application server instance host. For more information, see Creating Operating System Users [page 62].</td>
</tr>
<tr>
<td>User sapadm</td>
<td>User sapadm is used for central monitoring services. If you did not create user sapadm manually before the installation, SAPinst creates it automatically during the installation. SAPinst sets the Master Password by default, but you can overwrite it either by choosing parameter mode Custom or by changing it on the parameter summary screen. Make sure that the user ID and group ID of sapadm are unique and the same on each application server instance host. For more information, see Creating Operating System Users [page 62].</td>
</tr>
<tr>
<td>User &lt;smdsid&gt;adm</td>
<td>User &lt;smdsid&gt;adm is dedicated to the Diagnostics Agent installation with sufficient authorization to manage the agent. If you did not create user &lt;smdsid&gt;adm manually before the installation, SAPinst creates it automatically during the installation. It is created on the central instance host and on every dialog instance host. SAPinst sets the Master Password by default, but you can overwrite it either by choosing parameter mode Custom or by changing it on the parameter summary screen. Make sure that the user ID and group ID of &lt;smdsid&gt;adm are unique and the same on each application server instance host. For more information, see Creating Operating System Users [page 62].</td>
</tr>
</tbody>
</table>
### User Management Engine (UME)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UME Configuration</td>
<td>SAPinst prompts you for how to configure the UME during the input phase of the installation. You can choose between the following options:</td>
</tr>
<tr>
<td></td>
<td>- Use Java database (default). If you choose this option, administrators can manage users and groups with the UME Web admin tool and SAP NetWeaver Administrator only.</td>
</tr>
<tr>
<td></td>
<td>- Use an external ABAP system. If you choose this option, administrators can manage users with the transaction SU01 on the external ABAP system, and, depending on the permissions of the communication user, also with the UME Web admin tool and SAP NetWeaver Administrator. You must have created the required users manually on the external ABAP system. For more information, see Preparing User Management for an External ABAP System [page 68]. For more information about supported UME data sources and change options, see SAP Note 718383.</td>
</tr>
</tbody>
</table>

#### Using the Java Database:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Java Administrator User</td>
<td>SAPinst sets the user name Administrator and the master password by default. If required, you can choose another user name and password according to your requirements.</td>
</tr>
<tr>
<td>Java Guest User</td>
<td>SAPinst sets the user name Guest and the master password by default. The Guest user is for employees who do not belong to a company or who have registered as company users with pending approval. Guest users belong to the default group Authenticated Users and have read access only.</td>
</tr>
</tbody>
</table>

#### Using an External ABAP System – Parameters for the ABAP Connection:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Server Instance Number</td>
<td>This is the instance number on the application server of the central ABAP system to which you want to connect the Application Server Java. To find out the number on the host of the primary application server instance, look under the SAP directory usr/sap/&lt;SAPSID&gt;/DVEBMGS&lt;nn&gt;. The value &lt;nn&gt; is the number assigned to the SAP system.</td>
</tr>
<tr>
<td>Application Server Host</td>
<td>This is the host name of the relevant application server instance. To find out the host name, enter hostname at the command prompt of the host running the primary application server instance.</td>
</tr>
<tr>
<td>Communication User</td>
<td>This is the name and password of the existing ABAP communication user. You must have created this user manually on the external ABAP system.</td>
</tr>
</tbody>
</table>

#### Using an External ABAP System – Parameters for the Application Server Java Connection:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator User</td>
<td>This is the name and password of the administrator user that you created on the external ABAP system.</td>
</tr>
<tr>
<td>Administrator Role</td>
<td>The role SAP_J2EE_ADMIN must exist on the external ABAP system.</td>
</tr>
</tbody>
</table>
### Parameter Description

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guest User</td>
<td>This is the name and password of the guest user that you created on the external ABAP system. The guest user is for employees who do not belong to a company or who have registered as company users with pending approval. Guest users belong to the default group Authenticated Users and have read access only.</td>
</tr>
<tr>
<td>Guest Role</td>
<td>The role SAP_J2EE_GUEST must exist on the external ABAP system.</td>
</tr>
</tbody>
</table>

### Key Phrase for Secure Store Settings

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Phrase for Secure Store Settings</td>
<td>This is a random word or phrase that is used to encrypt the secure store. The Java EE engine uses this phrase to generate the key that is used to encrypt the data. The uniqueness of the phrase you use contributes to the uniqueness of the resulting key.</td>
</tr>
</tbody>
</table>

**Recommendation**

Use a long key phrase that cannot be guessed easily. Use both uppercase and lowercase letters in the phrase and include special characters.

### Internet Communication Manager (ICM) User Management

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Password of webadm</td>
<td>The administration user webadm is created to use the web administration interface for Internet Communication Manager (ICM) and Web Dispatcher. SAPinst sets the master password by default. If required, you can choose another password. The length of the password must be between 5 and 128 characters.</td>
</tr>
</tbody>
</table>

### Host Agent

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Password of sapadm</td>
<td>The administration user sapadm is created to use central monitoring services. If this user does not already exist, SAPinst automatically creates it. SAPinst prompts you to enter either the password of the existing user or a new password for the user to be created.</td>
</tr>
</tbody>
</table>

### Solution Manager Key

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP Solution Manager key</td>
<td>To install your SAP system, you need to generate an SAP Solution Manager key [page 83], which the installation requires to continue. For more information, see SAP Note 805390.</td>
</tr>
</tbody>
</table>
## Parameters Relevant for the Directory Structure of the System

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP system mount directory</td>
<td>The SAP system mount directory <code>/&lt;sapmnt&gt;</code> is the base directory for the SAP system. For <code>/&lt;sapmnt&gt;</code> you can use a directory of your choice. If you do not specify a directory, SAPinst creates a directory named <code>sapmnt</code> by default. Do not add <code>&lt;SAPSID&gt;</code> as subdirectory because the installer adds this directory automatically.</td>
</tr>
</tbody>
</table>

**Example**

If you enter `/sapmount` for `/<sapmnt>` and `KB1` for `<SAPSID>` during the input phase of the installation, the installer creates the directory `/sapmount/KB1`.

For more information, see *Setting Up File Systems and Raw Devices* [page 71].

---

Only valid for: AIX;Linux;Windows

## Parameters Relevant for the Database

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location Name of DB2 Subsystem (DDF) and Port (DDF)</td>
<td>Contact your DB2 for z/OS database administrator to determine the location name and port. The administrator enters the command <code>-DISPLAY DDF</code>. The output shows the parameters LOCATION and TCPPORT, and their values are listed directly below them.</td>
</tr>
<tr>
<td>Volumes Catalog Identifier (VCAT)</td>
<td>Volumes Catalog Identifier (VCAT) is the high-level qualifier of the DB2 datasets.</td>
</tr>
<tr>
<td>Database Schema for Java</td>
<td>The default is <code>SAPJAVA</code>. This is relevant for MCOD Java and ABAP+Java systems. The schema you specify must be an existing user ID on the database server.</td>
</tr>
<tr>
<td>Database Administrator User ID</td>
<td>Valid user ID on the database server with SYSADM privileges on the DB2 subsystem on which you would like to install your SAP system. This user ID is only necessary for the installation process.</td>
</tr>
<tr>
<td>DB Connect User ID for ABAP Schema</td>
<td>Valid user ID on the database server needed during and after the installation. For more information, see <em>Necessary z/OS Group and User IDs</em> [page 66].</td>
</tr>
</tbody>
</table>

**Note**

When installing a database instance, the DB Connect User ID must be consistent for all instances.
### 3.2 Hardware and Software Requirements

You check that your hosts meet the hardware and software requirements for your operating system and the SAP instances.

**Caution**

If your hosts do not fully meet the requirements, you might experience problems when working with the SAP system.

**Prerequisites**

- Contact your OS vendor for the latest OS patches.
- Make sure that the host name meets the requirements listed in SAP Note 611361.
- Check your keyboard definitions.
- If you want to install a printer on a host other than the central instance host (for example, on a separate database instance host), make sure that the printer can be accessed under UNIX.
- If you have any questions, contact the person in charge of the installation, your Competence Center, or your local IBM representative.

---

**Parameters**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB Connect User ID for Java Schema</td>
<td>Valid user ID on the database server needed during and after the installation. For more information, see Necessary z/OS Group and User IDs [page 66].</td>
</tr>
<tr>
<td>Note</td>
<td>When installing a database instance, the DB Connect User ID must be consistent for all instances.</td>
</tr>
<tr>
<td>SDK Directory</td>
<td>SDK directory. This is required since we use Java applications for certain installation processes.</td>
</tr>
<tr>
<td>Location of the JDBC Driver</td>
<td>Directory containing the JDBC Driver files. The files are called: db2jcc.jar and db2jcc_license_cisuz.jar.</td>
</tr>
<tr>
<td>Database Subsystem ID (SSID)</td>
<td>Name of your DB2 subsystem ID.</td>
</tr>
<tr>
<td>Database Host</td>
<td>Name of your DB2 database host.</td>
</tr>
</tbody>
</table>

---

**End of: AIX/Linux/Windows**
Process Flow

1. Check the Product Availability Matrix at [http://service.sap.com/pam](http://service.sap.com/pam) for supported operating system releases.
2. Check the hardware and software requirements using:
   - The Prerequisite Checker:
     - Standalone (optional) before the installation process
       For more information, see Running the Prerequisite Checker Standalone [page 46].
     - Integrated in the installation tool (mandatory) as part of the installation process
       For more information, see Running SAPinst [page 93].

   ![Note]

   For the most recent updates to the Prerequisite Checker, always check SAP Note 855498.

   ![The hardware and software requirements checklists for:]

   Only valid for: AIX
   - AIX [page 47]
   - z/OS [page 49]
   - Standard system [page 53]

   ![Note]

   These requirements also apply if you want to install the Application Sharing Server as an Optional Standalone Unit.

   - High availability system [page 54]
   - If you want to install additional application server instances, check the requirements for an additional application server instance [page 58].
   - If you want to install the Application Sharing Server as an optional standalone unit, see the requirements for a standard system [page 53].
   - If you want to install the host agent on a host that does not have an SAP component, check the requirements for the host agent as a separate installation [page 59].

3. If you are installing a production system, the values provided by the Prerequisite Checker and the hardware and software requirements checklists are not sufficient. In addition, do the following:
   - You contact your hardware vendor, who can analyze the load and calculate suitable hardware sizing depending on:
     - The set of applications to be deployed
     - How intensively the applications are to be used
3.2 Hardware and Software Requirements

- The number of users

### 3.2.1 Running the Prerequisite Checker in Standalone Mode (Optional)

Before installing your SAP system, you can run the **Prerequisite Checker** in standalone mode to check the hardware and software requirements for your operating system (OS) and the SAP instances.

**Recommendation**

We recommend that you use **both** the **Prerequisite Checker** and the requirements tables for reference.

**Note**

When installing your SAP system, SAPinst automatically starts the **Prerequisite Checker** and checks the hardware and software requirements in the background.

**Prerequisites**

- If you are installing an ASCS or SCS instance of z/OS, you have to prepare z/OS for SAPinst [page 87].

**Procedure**

1. You start SAPinst [page 93].
2. On the Welcome screen, choose  &lt; SAP System &gt; Software Life-Cycle Options &gt; Additional Preparation Tasks &gt; Prerequisites Check  4.
3. Follow the instructions in the SAPinst dialogs and enter the required parameters.

**Note**

For more information about each parameter, position the cursor on the parameter field and choose **F1** in SAPinst.

When you have finished, the Parameter Summary screen appears summarizing all parameters you have entered. If you want to make a change, select the relevant parameters and choose Revise.

4. To start the **Prerequisite Checker**, choose Start.
3.2.2 Requirements for AIX

You use the following information to check that the host machine meets the requirements listed in the table below:

Note
The information here is not intended to replace the documentation of the AIX operating system.

You can perform AIX-specific steps as follows:

- Manually by entering AIX commands with the appropriate options
- Using System Management Interface Tool (SMIT), a menu-driven system administration tool

If you have problems with the function keys, you can also use [ESC] and the corresponding number to simulate the function key (for example, [F4] is equivalent to [ESC] and [4]).

### Hardware Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tape drive</td>
<td>High-capacity tape drive with hardware compression is recommended. You can test the drive /dev/rmt0 with this command: <code>&lt;tar -cuf /dev/&lt;tape_device&gt; &lt;test_file&gt;</code> The device name is always rmt0 unless more than one tape drive exists.</td>
</tr>
</tbody>
</table>
| DVD drive         | - ISO 9660 compatible  
                    - You can configure multiple CD or DVD drives, but you cannot mount all of them. For more information, see *Mounting a CD / DVD for AIX* [page 131]. |
| Required disks    | For data security reasons, you need to distribute over at least three disks. We recommend you to distribute over five disks.  
                    To display available disks, enter this command: `lspv`  
                    Disks marked `none` in the 3rd column are unused.  
                    To display free space on a disk, enter this command: `lspv -P <disk_name>`  
                    Areas marked `free` in the 2nd column are unused.  
                    If an advanced disk array is available (for example, RAID), contact your hardware vendor to make sure that the data security requirements are covered by this technology. |
### Software Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>C++ runtime level</strong></td>
<td>Check the C++ runtime level with the following commands:</td>
</tr>
<tr>
<td>AIX 6.x:</td>
<td>- <code>#lslpp -L x1C.aix61.rte</code></td>
</tr>
<tr>
<td></td>
<td>The output must be at least 9.0.0.1.</td>
</tr>
<tr>
<td>AIX 5.x:</td>
<td>- <code>#lslpp -L x1C.rte</code></td>
</tr>
<tr>
<td></td>
<td>The output must be at least 9.0.0.1.</td>
</tr>
<tr>
<td>AIX 5.2:</td>
<td>- <code>#lslpp -L x1C.aix50.rte</code></td>
</tr>
<tr>
<td></td>
<td>The output must be at least 8.0.0.5.</td>
</tr>
<tr>
<td>Operating system version</td>
<td>Check the operating system version with this command:</td>
</tr>
<tr>
<td></td>
<td><code>lspp -1 bos.rte</code></td>
</tr>
<tr>
<td></td>
<td>The output must include the following or a larger version number: <code>bos.rte 5.2.0.75</code></td>
</tr>
<tr>
<td>AIX Maintenance Level (ML)</td>
<td>AIX Maintenance Level (ML) and Technology Level (TL)</td>
</tr>
<tr>
<td>and Technology Level (TL)</td>
<td>- AIX 6.1: the output of the command <code>oslevel -s</code> should be at least 6100-00-01.</td>
</tr>
<tr>
<td>LDAP (Lightweight Directory</td>
<td>- AIX 5.3: the output of the command <code>oslevel -s</code> should be at least 5300-05-01 (TL 5 SP 1).</td>
</tr>
<tr>
<td>Access Protocol)</td>
<td>- AIX 5.2: the output of the command <code>oslevel -r</code> should be at least 5200-06 (ML 6).</td>
</tr>
<tr>
<td>Additional software</td>
<td>Make sure that the following additional file sets are installed:</td>
</tr>
<tr>
<td></td>
<td>- <code>bos.adt</code> – Base Application Development</td>
</tr>
<tr>
<td></td>
<td>- <code>bos.perf</code> – performance and diagnostics tools</td>
</tr>
<tr>
<td></td>
<td>- <code>perfagent.tools</code> – performance monitoring tools</td>
</tr>
<tr>
<td></td>
<td>- <code>bos.perf.libperfstat</code> – Performance Statistics Library</td>
</tr>
<tr>
<td></td>
<td>For an overview of the installed file sets, enter the following command: `lslpp -L</td>
</tr>
<tr>
<td></td>
<td>Install the necessary local code set by adding an additional language environment as follows:</td>
</tr>
<tr>
<td></td>
<td>1. Start the System Management Interface Tool (SMIT) with the following command: <code>smitty mle_add_lang</code></td>
</tr>
<tr>
<td></td>
<td>2. Select the following:</td>
</tr>
<tr>
<td></td>
<td>- Cultural Conventions to install: <code>ISO8859-1 German (Germany) [de_DE]</code></td>
</tr>
</tbody>
</table>
3.2 Hardware and Software Requirements

3.2.3 Requirements for z/OS

The information in this section is provided to help you fulfill the minimum requirements on z/OS. The following table lists the requirements for the database instance in a standard system installation with an application server on AIX, Linux or Windows and for a SAP central services installation on z/OS.

**Hardware Requirements**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>IBM System z capable of supporting z/OS Version 1.7 or higher. The supported operating system releases are listed in the SAP Service Marketplace at <a href="http://service.sap.com/platforms">http://service.sap.com/platforms</a>.</td>
</tr>
<tr>
<td>Disk Space</td>
<td>At least 60 GB disk space (DASD) exclusively for the database.</td>
</tr>
<tr>
<td>Real memory for</td>
<td>For production systems, at least 400 MB plus 200 MB for each SAP system, configured as central storage. For non-production systems, at least 150 MB plus 50 MB for each SAP system.</td>
</tr>
<tr>
<td>z/OS</td>
<td></td>
</tr>
</tbody>
</table>
Software Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system-related Software</td>
<td>z/OS, Version 1.7 or higher with the following components installed:</td>
</tr>
<tr>
<td></td>
<td>- UNIX System Services</td>
</tr>
<tr>
<td></td>
<td>- DFSMS</td>
</tr>
<tr>
<td></td>
<td>- TCP/IP</td>
</tr>
<tr>
<td></td>
<td>- LE/370</td>
</tr>
<tr>
<td></td>
<td>- DFSORT</td>
</tr>
<tr>
<td></td>
<td>- Security Server (RACF or equivalent product)</td>
</tr>
<tr>
<td></td>
<td>- JES2 or JES3 installed and configured.</td>
</tr>
<tr>
<td></td>
<td>- RMF or another compatible product that supports the Sysplex Data Services (ERBDSORY, ERBDSREC, ERB2XDG5S, ERB3XDRS) installed for saposco1 for z/OS.</td>
</tr>
<tr>
<td></td>
<td>- z/OS RRS installed and set up. For more information, see SAP Planning Guide: DB2 for z/OS Setting Up Resource Recovery Services (RRS)liste RRS.</td>
</tr>
<tr>
<td></td>
<td>- z/OS Unicode Conversion Services (UCS) and appropriate conversion definitions need to be set up for your environment. For more information, see the IBM DB2 documentation and Information APARs III3048, III3049, III3277, III3695.</td>
</tr>
<tr>
<td></td>
<td>Note: The supported operating system releases are listed on SAP Service Marketplace at <a href="http://service.sap.com/platforms">http://service.sap.com/platforms</a>.</td>
</tr>
<tr>
<td>APARs and PTFs</td>
<td>Required APARs:</td>
</tr>
<tr>
<td></td>
<td>- Obtain the SAP Note number for the list of required APARs from SAP Note 81737.</td>
</tr>
<tr>
<td></td>
<td>- Ask your system programmer whether all PTFs for these APARs have been installed.</td>
</tr>
<tr>
<td></td>
<td>- Set up the PTF check tool, which automatically checks installed PTFs. Refer to SAP Note 183311.</td>
</tr>
<tr>
<td>FTP Server</td>
<td>FTP server installed and configured (REGION=0M for the installation):</td>
</tr>
<tr>
<td></td>
<td>- Issue <code>ftp&lt;db_host&gt;</code> on an application server, where <code>&lt;db_host&gt;</code> is the z/OS host name.</td>
</tr>
</tbody>
</table>

Additional Requirements and Settings

Note: For more information about z/OS prerequisites, see SAP Planning Guide: DB2 for z/OS.

Recommended DB2 Settings

The recommended DB2 settings are listed in the SAP documentation SAP DBA Guide: DB2 for z/OS. These initial values are recommended if the DB2 subsystem is used exclusively for the SAP system. As a result of monitoring the DB2 performance, you might need to change some of the values.

Logging

We recommend that you employ dual logging. DB2 logs for installation must tolerate up to 2 GB/hour. Archiving is required, and there must be at least 20GB of archiving space. Most of this space can be reclaimed after the SAP system on DB2 is up and running. The preferred archiving medium is
disk, with tape silos representing the second-most preferred medium. If there is a lack of volume space, warnings are written to the z/OS console.

**Note**

DB2 stops if it cannot perform logging, for example, due to a lack of volume space.

**DB2 Subsystem Installation Check**

1. Verify that the DB2 subsystem is running by executing the following command from TSO:
   
   ```
   dsn system (<Database Attach Name>)
   ```
   
2. If the subsystem is accessible, this command calls the DB2 command processor. Otherwise, an error message is displayed.
3. To leave the DB2 command processor, use the command: **END**.

**Connection to the Database Server**

After the primary application server instance has been installed, you need to check the connection to the database server:

1. Log on as `<sapsid>adm`.
2. Enter the following command:
   
   ```
   R3trans -x
   ```
   
   The return code should be 0 (zero). This indicates that all connections are working.
   - If the return code is greater than 0, check that your database was started and check the connection again with R3trans.
   - If that still fails, check your environment variable settings, which is listed in the output of R3trans.
   
   The output of R3trans is written to the `trans.log` file.

### 3.2.4 Requirements for DB2 for z/OS

The following are database-related requirements that must be fulfilled for your SAP system on IBM DB2 for z/OS:

**Note**

These requirements apply to all instances, except for the central services instance.
Requirements for DB2 for z/OS

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database to Application Server Connection</td>
<td>You need to have a connection between the application server on UNIX and the database server. For more information, see <em>SAP Planning Guide: DB2 for z/OS</em>. See also the IBM documentation site at <a href="http://www.ibm.com/servers/eserver/zseries/software/sap/docu.html">http://www.ibm.com/servers/eserver/zseries/software/sap/docu.html</a>. High Availability for SAP on IBM System z Using Autonomic Computing technologies, SC33–8206.</td>
</tr>
</tbody>
</table>
| Database-related software                        | - DB2 for z/OS, Version 8 or Version 9 installed. DDF (Distributed Data Facility) is configured. For more information, see [SAP DBA Guide: DB2 for z/OS DB2 Setup](https://www.sap.com).  
  
  **Note**  
  If you are using DB2 for z/OS Version 9, you **must** use z/OS Version 1.7.  
  - DB2 Utilities Suite for z/OS  
  - Control Center for DB2 for z/OS (FMID JDB88ID)  
  - Workload manager (WLM) set up for DB2 stored procedures installed. For more information, see [SAP DBA Guide: DB2 for z/OS Stored Procedures Enablement](https://www.sap.com).                                                                                                                                                                                                                     |
| CLI and JDBC Drivers                              | The CLI and JDBC Drivers are installed automatically by SAPInst. However, you need to obtain a license for these products, since the delivered license is only valid for 90 days. To install the license:  
  1. If you are an OEM customer, you can download the license from [http://service.sap.com/swcenter-3pmain](http://service.sap.com/swcenter-3pmain). [DB2 for z/OS License Files for IBM DB2 Connect V9.x](https://www.sap.com).  
  2. If you are an IBM customer, contact your IBM representative.  
  3. When you have the license, copy it to the license directory `<drive letter>:\usr\sap\<SID>\<INSTANCE>\exe\db2_c1idriver\license`.  
  **Note**  
  The measure enables you to avoid downtime when the trial license expires after 90 days.                                                                                                                                                                                                                                                                                                                                                              |
| JDBC License                                      | If your SAP system is Java-only, you need to obtain the JDBC license **before** you install your SAP system. To install the license:  
  1. If you are an OEM customer, you can download the license from [http://service.sap.com/swcenter-3pmain](http://service.sap.com/swcenter-3pmain). [DB2 for z/OS License Files for IBM DB2 Connect V9.x](https://www.sap.com).  
  2. If you are an IBM customer, contact your IBM representative.  
  **Note**  
  Only relevant for a Java-only system.                                                                                                                                                                                                                                                                                                                                                                                                    |

**Additional Requirements and Settings**

**Recommended DB2 Settings**

Recommended DB2 settings are listed in the SAP documentation *SAP DBA Guide: DB2 for z/OS*. These initial values are recommended if the DB2 subsystem is used exclusively for the SAP system. You might need to change some of the values after monitoring DB2 performance.
Logging

We recommend that you employ dual logging. DB2 logs for installation must tolerate up to 2 GB/hour. Archiving is required, and there must be at least 20GB of archiving space. Most of this space can be reclaimed after the SAP system on DB2 is up and running. The preferred archiving medium is disk, with tape silos representing the second-most preferred medium. If there is a lack of volume space, warnings are written to the z/OS console.

Note

DB2 stops if it cannot perform logging, for example, due to a lack of volume space.

DB2 Subsystem Installation Check

1. Verify that the DB2 subsystem is running by executing the following command from TSO:
   
   `dsn system (<Database Attach Name>)`

2. If the subsystem is accessible, this command calls the DB2 command processor. Otherwise, an error message is displayed.

3. To leave the DB2 command processor, use the command: **END**.

Connection to the Database Server

After the central instance has been installed, you need to check the connection to the database server:

1. Log on as `<sapsid>adm`.
2. Enter the following command:
   
   `R3trans -x`

   The return code should be 0 (zero). This indicates that all connections are working.

   - If the return code is greater than 0, check that your database was started and check the connection again with `R3trans`.
   - If that still fails, check your environment variable settings, which is listed in the output of `R3trans`.

   The output of `R3trans` is written to the `trans.log` file.

### 3.2.5 Requirements for a Standard System

If you want to install a standard system — that is, all instances reside on one host (except for the database instance [page 49]) — the host must meet the following requirements:
3.2.6 Requirements for a High Availability System

The following sections provide information about the hardware and software requirements for a high-availability system, where the following SAP instances can reside on different hosts or on a switchover cluster infrastructure:

- **Enqueue replication server instances** [page 56]
- **Database instance** [page 57]
3.2.6.1 Requirements for a Central Services Instance

The central services instance host must meet the following requirements for the central services instance (SCS):

Hardware Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
</table>
| Hard disk space | - Hard disk drives with sufficient space for the central services instance  
- For more information, see SAP Directories [page 72].  
- 4.3 GB of temporary disk space for every required installation DVD that you have to copy to a local hard disk  
- For more information, see Preparing the Installation DVDs [page 84].  
- 1.2 GB of temporary disk space for the installation. |
| Minimum RAM   | 1 GB                                                                                                                                                  |
| Swap Space    | You need hard disk drives with sufficient space for swap. The required swap space can be calculated as follows:  
- Optimistic strategy:  
  - At least 20 GB for the first SAP Instance to be installed on a server and at least 10 GB for each additional active SAP Instance on that server  
- Defensive strategy:  
  - 3 * RAM  
  - End of: AIX  
  - [Only valid for: AIX]  
  - For more information, see SAP Note 1121904.  
  - End of: AIX  
  - [Only valid for: Solaris:z/OS]  
  - 3 to 4 * RAM, at least 20 GB  
  - End of: Solaris:z/OS |

Software Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network File System (NFS)</td>
<td>Network File System (NFS) must be installed.</td>
</tr>
</tbody>
</table>
### 3.2.6.2 Requirements for an Enqueue Replication Server Instance

The host on which an enqueue replication server instance runs must meet the following requirements:

#### Note

The enqueque replication server instance is only required for high-availability systems.

You need one ERS for each Java SCS and one ERS for each ABAP SCS (ASCS) installed in your system.

#### Hardware Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard disk space</td>
<td>- Hard disk drives with sufficient space for the central services instance &lt;br&gt; For more information, see <em>SAP Directories</em> [page 72].&lt;br&gt; - 4.3 GB of temporary disk space for every required installation DVD that you have to copy to a local hard disk &lt;br&gt; For more information, see <em>Preparing the Installation DVDs</em> [page 84]. &lt;br&gt;- 1.2 GB of temporary disk space for the installation.</td>
</tr>
<tr>
<td>Minimum RAM</td>
<td>1 GB</td>
</tr>
<tr>
<td>Swap Space</td>
<td>You need hard disk drives with sufficient space for swap. The required swap space can be calculated as follows:&lt;br&gt;  &lt;br&gt;</td>
</tr>
</tbody>
</table>
3.2 Hardware and Software Requirements

Software Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network File System (NFS)</td>
<td>Network File System (NFS) must be installed.</td>
</tr>
</tbody>
</table>

More Information

For more information on operating system-specific requirements, see Requirements for z/OS [page 49].

End of: HA (UNIX)

3.2.6.3 Requirements for the Database Instance

For your database host requirements, see the following sections:

- Requirements for z/OS [page 49]
- Requirements for DB2 for z/OS [page 51]

3.2.6.4 Requirements for the Primary Application Server Instance

The host where the primary application server instance runs must meet the following requirements:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard disk space</td>
<td>- Hard disk drives with sufficient space for the primary application server instance.</td>
</tr>
<tr>
<td></td>
<td>For more information, see SAP Dictionaries [page 72].</td>
</tr>
<tr>
<td></td>
<td>4.3 GB of temporary disk space for every required installation DVD that</td>
</tr>
<tr>
<td></td>
<td>you have to copy to a local hard disk. For more information, see Preparing</td>
</tr>
<tr>
<td></td>
<td>the Installation DVDs [page 84].</td>
</tr>
<tr>
<td></td>
<td>1.2 GB of temporary disk space for the installation.</td>
</tr>
</tbody>
</table>
3.2 Hardware and Software Requirements

### 3.2.7 Requirements for an Additional Application Server Instance

The additional application server host must meet the following requirements:

#### Hardware Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
</table>
| Hard disk space                    | - Hard disk drives with sufficient space for the additional application server instance.  
                                         For more information, see *SAP Dictionaries* [page 72].  
                                         - 4.3 GB of temporary disk space for every required installation DVD that you have to copy to a local hard disk. For more information, see *Preparing the Installation DVDs* [page 84].  
                                         - 1.2 GB of temporary disk space for the installation.                                                                                          |
3.2 Hardware and Software Requirements

### Requirement

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum RAM</td>
<td>1 GB</td>
</tr>
<tr>
<td>Swap Space</td>
<td>You need hard disk drives with sufficient space for swap. The required swap space can be calculated as follows:</td>
</tr>
<tr>
<td></td>
<td>- Only valid for AIX</td>
</tr>
<tr>
<td></td>
<td>- Optimistic strategy: At least 20 GB for the first SAP Instance to be installed on a server and at least 10 GB for each additional active SAP Instance on that server</td>
</tr>
<tr>
<td></td>
<td>- Defensive strategy: 3 * RAM</td>
</tr>
<tr>
<td></td>
<td>- End of: AIX</td>
</tr>
<tr>
<td></td>
<td>- Only valid for: AIX</td>
</tr>
<tr>
<td></td>
<td>For more information, see SAP Note <a href="https://service.sap.com/swdc">1121904</a></td>
</tr>
<tr>
<td></td>
<td>- End of: AIX</td>
</tr>
<tr>
<td></td>
<td>- Only valid for: Solaris/z/OS</td>
</tr>
<tr>
<td></td>
<td>3 to 4 * RAM, at least 20 GB</td>
</tr>
<tr>
<td></td>
<td>- End of: Solaris/z/OS</td>
</tr>
</tbody>
</table>

Software Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP kernel</td>
<td>Make sure that the SAP kernel of the primary application server instance has at least the patch level of the SAP kernel on the SAP Kernel DVD that is used for the installation of the additional application server instance. We recommend that you apply the most current SAP kernel from the SAP Service Marketplace at <a href="http://service.sap.com/swdc">http://service.sap.com/swdc</a>.</td>
</tr>
<tr>
<td>Network File System (NFS)</td>
<td>Network File System (NFS) must be installed.</td>
</tr>
</tbody>
</table>

### 3.2.8 Requirements for a Standalone Host Agent

If you want to install a standalone host agent, the installation host has to meet the following requirements:
### Hardware Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
</table>
| Hard Disk Space      | - Minimum disk space  
                        | For information about the required disk space per file system, see Setting Up File Systems [page 71]  
                        | - 4.3 GB of temporary disk space for every required installation DVD that you have to copy to a local hard disk. For more information, see Preparing the Installation DVDs [page 84].  
                        | - 1.2 GB of temporary disk space for the installation.                                                                                              |
| Minimum RAM          | 0.5 GB                                                               |
| Swap space           | You need hard disk drives with sufficient space for swap. The required swap space can be calculated as follows:                                       |
|                      | [Only valid for: AIX](#)                                             |
|                      | - Optimistic strategy:                                               |
|                      |   At least 20 GB for the first SAP Instance to be installed on a server and at least 10 GB for each additional active SAP Instance on that server  |
|                      | - Defensive strategy:                                               |
|                      |   3 * RAM                                                            |
|                      | [End of: AIX](#)                                                    |
|                      | [Only valid for: AIX](#)                                             |
|                      | For more information, see SAP Note [1121904](#).                    |
|                      | [End of: AIX](#)                                                    |
|                      | [Only valid for: Solaris/z/OS](#)                                    |
|                      | 3 to 4 * RAM, at least 20 GB                                         |
|                      | [End of: Solaris/z/OS](#)                                            |

### Software Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Values and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network File System</td>
<td>Network File System (NFS) must be installed.</td>
</tr>
</tbody>
</table>

### 3.2.9 Configuring z/OS UNIX System Services

**Note**

Only applicable for a central services instance on z/OS.

For information on how to configure z/OS UNIX System Services, see [SAP Planning Guide for z/OS](#) [Pre-Installation Activities](#) [Configuring z/OS](#) [Configuring SAP on z/OS](#) [Selecting the UNIX System Service Parameters](#) and [UNIX System Services Parameters for the SAP Central Services Instance on z/OS in Detail](#).
3.2.10 Setting up Swap Space for AIX

1. Check the allocated swap space:
   a) To start the System Management Interface Tool (SMIT), enter the following command:
      ```sh
      smitty
      ```
   b) Perform one of the following steps:
      - Choose ▶ Physical & Logical Storage ▶ Logical Volume Manager ▶ Paging Space ▶ List All Paging Spaces ▶
      - Enter this command:
        ```sh
        lps -a
        ```
2. Check if there is sufficient swap space: 3 to 4 * RAM is recommended, at least 20 GB.
3. If required, add another paging space using smitty:
   a) Choose ▶ Physical & Logical Storage ▶ Logical Volume Manager ▶ Paging Space ▶ Add Another Paging Space ▶
      A list of volume group names is displayed.
   b) Select a volume group.
   c) Enter the size of paging space in logical partitions.
   d) Set Start using this paging space NOW? to YES.
   e) Set Use this paging space each time the system is RESTARTED to YES.
   f) To exit smitty, choose [F10].
   g) To check the results, follow the procedure described above in step 1.

3.3 Specifying the Virtual Host Name

If you want to use a virtual host name, you can set the environment variable `SAPINST_USE_HOSTNAME` to specify the virtual host name before you start SAPinst.

You can also specify the virtual host name by `starting SAPinst [page 93]` with an equivalent parameter in the command line.

**Procedure**

Set `SAPINST_USE_HOSTNAME` to the virtual host name of the machine on which you are installing an SAP instance as follows:

<table>
<thead>
<tr>
<th>Shell Used</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bourne shell (sh)</td>
<td><code>SAPINST_USE_HOSTNAME=&lt;directory&gt;</code></td>
</tr>
<tr>
<td></td>
<td><code>export SAPINST_USE_HOSTNAME</code></td>
</tr>
</tbody>
</table>
### 3.4 Performing Switchover Preparations for High Availability

Do the following to prepare the switchover cluster:

**Procedure**

1. Make sure that the virtual host name [page 92] can be correctly resolved in your Domain Name System (DNS) setup.
2. Assign the virtual IP addresses and host names for the SCS instance, and (if required) NFS to appropriate failover groups.

**Note**

For more information on virtual addresses and virtual host names and how to assign resources to failover groups, ask your HA partner.

### 3.5 Creating Operating System Users and Groups

During the installation, SAPinst checks all required accounts (users, groups) and services on the local machine. SAPinst checks whether the required users and groups already exist. If not, it creates new users and groups as necessary.

**Note**

Users and groups that need to be created on z/OS need to be created manually. For more information, see *Necessary z/OS Group and User IDs* [page 66].

If you do not want SAPinst to create operating systems users, groups, and services automatically, you can optionally create them before the installation. This might be the case if you use central user management such as Network Information System (NIS).
SAPinst checks if the required services are available on the host and creates them if necessary. See the log messages about the service entries and adapt the network-wide (NIS) entries accordingly.

SAPinst checks the NIS users, groups, and services using NIS commands. However, SAPinst does **not** change NIS configurations.

**Recommendation**
For a distributed or a high-availability system, we recommend that you distribute account information (operating system users and groups) over the network, for example by using Network Information Service (NIS).

**Caution**
All users **must** have identical environment settings. If you change the environment delivered by SAP, such as variables, paths, and so on, we do **not** assume responsibility.

If you want to use global accounts that are configured on a separate host, you can do this in one of the following ways:

- You start SAPinst and choose **Software Life-Cycle Tasks** ➤ **Additional Preparation Tasks** ➤ **Operating System Users and Groups**. For more information, see *Running SAPinst* [page 93].
- You create operating system users and groups manually as described in *Creating AIX Groups and Users (Optional)* [page 65]

**Caution**
Do **not** delete any shell initialization scripts in the home directory of the OS users. This applies even if you do not intend to use the shells that these scripts are for.

**Caution**
The user ID (UID) and group ID (GID) of each operating system user and group must be identical for all servers belonging to the same SAP system.

This does not mean that all users and groups have to be installed on all SAP servers.
### Users and Their Groups

<table>
<thead>
<tr>
<th>User</th>
<th>Primary Group</th>
<th>Secondary Group(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt;sapsid&gt;adm</code></td>
<td>sapsys</td>
<td>sapinst (&lt;z/OS)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>End of: <code>&lt;z/OS</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Only valid for: AIX;Linux</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sapinst</td>
</tr>
<tr>
<td></td>
<td></td>
<td>You need the following secondary DB2 Connect groups:</td>
</tr>
</tbody>
</table>
|               |               | dasadm1
|               |               | db2grp1
|               |               | (These names are merely a recommendation.) |
|               |               | End of: AIX;Linux  |
| `root`        | sapsys        | sapinst           |

### Users and Groups of the SAP System

<table>
<thead>
<tr>
<th>User</th>
<th>Primary Group</th>
<th>Additional Group</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>sapadm</code></td>
<td>sapsys</td>
<td>sapinst</td>
<td>Host Agent administrator</td>
</tr>
</tbody>
</table>

**Caution**

If these operating system users already exist, make sure that they are assigned to group `sapinst`.

**Caution**

If you install a distributed system and you use local operating system user accounts instead of central user management (for example, NIS), user `<sapsid>adm`, `sapadm`, and the database operating system user must have the same password on all hosts.

### Groups and Members

<table>
<thead>
<tr>
<th>Groups</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>sapsys</td>
<td><code>&lt;sapsid&gt;adm</code>&lt;br&gt;root</td>
</tr>
<tr>
<td>sapinst</td>
<td><code>&lt;sapsid&gt;adm</code>&lt;br&gt;root</td>
</tr>
</tbody>
</table>
3 Preparation
3.5 Creating Operating System Users and Groups

Groups and Members of the Standalone Host Agent User

<table>
<thead>
<tr>
<th>Groups</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>sapsys</td>
<td>sapadm</td>
</tr>
<tr>
<td>sapinst</td>
<td>sapadm</td>
</tr>
</tbody>
</table>

Only valid for: AIX

3.5.1 Creating AIX Groups and Users (Optional)

Creating AIX Groups and Users
To create AIX groups and users, use the System Management Interface Tool (SMIT):

1. Create groups as follows:
   a) Enter the command `smitty``.
   b) Choose `Security and Users` ➤ `Groups` ➤ `Add a group` ✗.
   c) Enter a group name – for example, `sapsys` – and set `administration group` to `true`.
   d) Press F3 until the `Security & Users` menu appears.
2. To create users, proceed as follows:
   a) Enter a user name, for example `<sapsid>adm`.
   b) Enter all required values.
3. Set the initial password using the following command:

   `passwd <user>`

   `Example`

   `passwd <sapsid>adm`

Checking Created Users
As user `root` check all existing users as follows:

1. Enter the command `smitty`.
3. To get a list of users, choose [F4]
4. For user `root` and each created user `<user>` perform the following steps:
   a) Select `<user>`.
   b) Change field `Soft CPU time` to `-1` (this is the default value).
   c) Change field `Soft DATA segment` to `-1`. 
d) Change field Soft STACK size to -1. You must make sure that the system-wide default HARD values are not explicitly defined to be lower than the values given above. Check the file /etc/security/limits under the default stanza. If they are not explicitly set, then the values are as shown in the table at the top of the file.

### Checking the Operating System

1. Enter the command `smitty`.
3. Change Maximum number of PROCESSES allowed per user to 588.
4. To exit SMIT, choose F10.

### 3.5.2 Necessary z/OS Group and User IDs

The following is a list of the z/OS group and z/OS user IDs necessary for your system. If these group or user IDs do not already exist in your system, you must create them. For more information, see `SAP Security Guide for IBM DB2 for z/OS` → `Security Settings for z/OS`.

**Note**

For each group and user, you must create an entry in the table `/etc/ulastable`, to ensure that each group and user can be used in both upper and lowercase.

#### Necessary z/OS Group and User IDs

<table>
<thead>
<tr>
<th>Group/User ID</th>
<th>Description</th>
<th>Usage Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB Connect User ID for AS Java</td>
<td>Permanent user needed for the database connection. You are free to choose the name of this user. If you are installing both usage types, we advise you to choose different names for the user IDs for AS ABAP and AS Java.</td>
<td>AS Java</td>
</tr>
<tr>
<td>Group ID for Java Schema</td>
<td>Permanent group needed for the Java schema. This group ID must be the same as the name of the Java schema that you specify during installation. If you are installing both usage types, we advise you to choose different names for the group IDs for ABAP schema and Java schema.</td>
<td>AS Java</td>
</tr>
<tr>
<td>sapsys Group ID</td>
<td>Permanent group needed for the central services instance on z/OS.</td>
<td>AS ABAP, AS Java</td>
</tr>
<tr>
<td>&lt;sapsid&gt;adm User ID</td>
<td>Permanent user needed for the central services instance on z/OS.</td>
<td>AS ABAP, AS Java</td>
</tr>
</tbody>
</table>
### 3.5 Creating Operating System Users and Groups

<table>
<thead>
<tr>
<th>Group/User ID</th>
<th>Description</th>
<th>Usage Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>User ID to install an SAP central services instance on z/OS</td>
<td>Temporary user needed for the SAP central services instance installation.</td>
<td>AS ABAP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AS Java</td>
</tr>
<tr>
<td>sapinst Group ID</td>
<td>Permanent group needed for the central services instance on z/OS.</td>
<td>AS ABAP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AS Java</td>
</tr>
<tr>
<td>sapadm</td>
<td>Permanent user needed for the host agent on z/OS.</td>
<td>AS ABAP</td>
</tr>
</tbody>
</table>

**Caution**

The user ID (UID) and group ID (GID) of SAP users and groups must be identical for all servers belonging to any SAP system. This does not mean that all users and groups have to be installed on all SAP servers.

### Users and Groups for Central Services Instance on z/OS

The following tables list the users and groups necessary for your database:

#### Users and Their Groups

<table>
<thead>
<tr>
<th>User</th>
<th>Primary Group</th>
<th>Secondary Group(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;sapsid&gt;adm</td>
<td>sapsys</td>
<td>sapinst</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Only valid for: z/OS</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>sapinst</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>End of: z/OS</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Only valid for: AIX;Linux</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>sapinst</td>
</tr>
<tr>
<td></td>
<td></td>
<td>You need the following secondary DB2 Connect groups:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- dasadm1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- db2grp1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(These names are merely a recommendation.)</td>
</tr>
<tr>
<td>root</td>
<td>sapsys</td>
<td>sapinst</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>End of: AIX;Linux</strong></td>
</tr>
</tbody>
</table>

**End of: z/OS**
3.6 Preparing User Management for an External ABAP System

For a Java system, you can also deploy user management for an external ABAP system. In this case, you configure the User Management Engine (UME) of Application Server Java (AS Java) for the user management of a separate ABAP system.

If you want to connect more than one Java system to the same ABAP system, you need to work out a concept for the communication, administrator, and guest users for each system.

You can take one of the following approaches:

Groups and Members

<table>
<thead>
<tr>
<th>Groups</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>sapsys</td>
<td>&lt;sapsid&gt;adm</td>
</tr>
<tr>
<td></td>
<td>root</td>
</tr>
<tr>
<td>sapinst</td>
<td>&lt;sapsid&gt;adm</td>
</tr>
<tr>
<td></td>
<td>root</td>
</tr>
</tbody>
</table>

End of: z/OS

Users and Their Primary Groups for the Host Agent

Note

This user is only necessary when you install an ASCS or SCS instance on z/OS.

Users and Groups of the SAP System

<table>
<thead>
<tr>
<th>User</th>
<th>Primary Group</th>
<th>Additional Group</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>sapadm</td>
<td>sapsys</td>
<td>sapinst</td>
<td>Host Agent administrator</td>
</tr>
</tbody>
</table>

Only valid for: z/OS

Enhanced ASCII Setup on z/OS

To enable enhanced ASCII support, see the procedure in the SAP Security Guide, section Security Settings for z/OS, Group IDs and User IDs, User ID to Install an SAP Central Services Instance on z/OS.

End of: z/OS

3.6 Preparing User Management for an External ABAP System
### Preparing User Management for an External ABAP System

#### Approach

<table>
<thead>
<tr>
<th>Approach</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each Java system uses different users</td>
<td>No interdependencies between the connected engines</td>
<td>Initially more administration to create the users in the ABAP system</td>
</tr>
</tbody>
</table>
| All Java systems use the same configuration | You create the users only once and enter the same information for every Java systems that you install. | Interdependencies between the connected engines:  
  - If you change the password of any of the users on the ABAP system, this change affects all connected engines. 
  - If you change the administrator user’s password, you must also change the password in secure storage on all of the connected Java systems. |

#### Recommendation

For security reasons, we recommend the first approach.

The procedures below assume that you are using the first approach.

### Prerequisites

- The ABAP system is based on at least SAP Web AS ABAP release 6.20 SP25.
- In transaction PFCG, check that the roles `SAP_BC_JSF_COMMUNICATION` and `SAP_BC_JSF_COMMUNICATION_R0` exist and make sure that their profiles are generated.
- In transaction PFCG, check that the roles `SAP_J2EE_ADMIN`, `SAP_J2EE_GUEST` and `SAP_BC_FP_ICF` exist. Neither role contains any ABAP permissions, so you do not need to generate any profiles.
- For more information, see the SAP Library [page 14](#):  
  - Function-Oriented View  
  - Security  
  - Identity Management  
  - Identity Management of the Application Server Java  
  - User Management Engine  

#### Note

For more information about role maintenance, see the SAP Library [page 14](#) at  
- Function-Oriented View  
- Security  
- Identity Management  
- Identity Management of the Application Server ABAP  
- AS ABAP Authorization Concept  

### Administration of the ABAP system

Perform the following administration steps in the ABAP system:

1. In transaction SU01, create a new communication user and assign it to the role `SAP_BC_JSF_COMMUNICATION_R0`.  

3.6 Preparing User Management for an External ABAP System

**Recommendation**

We recommend that you assign this user the role `SAP_BC_JSF_COMMUNICATION_R0` for read-only (display) access to user data with Java tools. If you intend to maintain user data (that is, to change, create, or delete users) with Java tools, you need to assign the role `SAP_BC_JSF_COMMUNICATION` instead.

We recommend that you name the user `SAPJSF_<SAPSID_Java_System>`. You can use any password.

In addition, to make sure that this user can only be used for communication connections between systems and not as a dialog user, assign it the type `Communications` under `Logon data`.

2. In transaction SU01, create a new dialog user and assign it to role `SAP_J2EE_ADMIN`. This is your administrator user in AS Java.

**Recommendation**

We recommend that you name the user `J2EE_ADM_<SAPSID_Java_System>`. You can use any password.

**Caution**

Log on to the SAP system once with this user to change its initial password. Since the installer of AS Java verifies this password, the installation fails if this password is initial.

3. In transaction SU01, create a new dialog user and assign it to role `SAP_J2EE_GUEST`. This is your guest user in AS Java.

**Recommendation**

We recommend that you name the user `J2EE_GST_<SAPSID_Java_System>`. You can use any password.

Since this user is only used for anonymous access to the system, we recommend you to deactivate the password and, if required, lock it after installation to prevent anyone from using it for explicit named logons.

4. In transaction SU01, create the following dialog users:

**Caution**

You must have changed the initial passwords of these users **before** you start the installation of the Java system.

- Users for Adobe Document Services (ADS) (optional):
  - **ADSCaller**:  
    In transaction PFCG, assign the role `ADSCallers` to this user.
3.7 Setting Up File Systems and Raw Devices

- **ADS_AGENT:**
  In transaction PFCG, assign the role SAP_BC_FP_ICF to this user.

- SLD Data supplier user (optional):
  You only have to create this user if you want to install System Landscape Directory (SLD). The SLD data supplier user name that you enter later on during the Java system installation must be identical to this user.

  ![Recommendation]
  We recommend that you name this user SLDDSUSER

- SLD ABAP API user (optional):
  You only have to create this user if you want to install System Landscape Directory (SLD). The SLD ABAP API user name that you enter later on during the Java system installation must be identical to this user.

  ![Recommendation]
  We recommend that you name this user SLDAPIUSER

### Activities for the Java System
Perform the following steps in the **Java** system:

1. **Before** the installation of the Java system, make sure that you have the correct user names and passwords of the users listed above for the separate ABAP system.
2. **During** the installation of the Java system, make sure that you enter the correct users and passwords in the corresponding SAPinst dialogs.

### 3.7 Setting Up File Systems and Raw Devices

The following section(s) describe the directory structures for the SAP system, how to set up SAP file systems for the SAP system and, if required, raw devices on operating system level:

![Note]
The installation of any SAP system does not require a special file system setup or separate partitions.

- **SAP Directories** [page 72]
- **Performing Switchover Preparations for High Availability** [page 62]
3.7 Setting Up File Systems and Raw Devices

- **Host Agent Directories** [page 76]
- **Setting Up File Systems for High-Availability** [page 76]
- **Configuring Network File System for High Availability** [page 78]

Only valid for: AIX

- **Setting Up File Systems and Raw Devices for AIX** [page 80]

End of: AIX

### 3.7.1 SAP Directories

Here we describe the directories of a typical SAP system.

SAPinst creates the following types of directories:

- Physically shared directories, which reside on the global host and are shared by Network File System (NFS)
- Logically shared directories, which reside on the local host(s) with symbolic links to the global host
- Local directories, which reside on the local host(s)

#### Features

The following figure shows the directory structure of the SAP system:

**Figure 8:** Directory Structure for a Java System

![Diagram of SAP directory structure]

**Key**
- Symbolic link
- Replication by sapcpe
- \[ERS<No>\]: High availability only
- \<codepage\>: Unicode
**Physically Shared Directories**

SAPinst creates the following directories:

- The directory `/<sapmnt>/<SAPSID>`, which contains SAP kernel and related files, is created on the first installation host. Normally, the first installation host is the host on which the central services instance is to run, but you can also choose another host for `/<sapmnt>/<SAPSID>`. You need to manually share this directory with Network File System (NFS) and – for a distributed system – mount it from the other installation hosts.

  SAPinst creates the following shared directories during the SAP system installation:
  - `global`
    - Contains globally shared data
  - `profile`
    - Contains the profiles of all instances
  - `exe`
    - Contains executable kernel programs

- The directory `/usr/sap/trans`, which is the global transport directory. If you want to use an existing transport directory, you have to mount it before you install the application server instance in question. Otherwise SAPinst creates `/usr/sap/trans` locally.

For more information, see *Exporting and Mounting the Global Transport Directory* [page 81].
### Directory File Systems and Raw Devices

<table>
<thead>
<tr>
<th>Directory</th>
<th>Required Disk Space</th>
</tr>
</thead>
</table>
| `<sapmnt>/SAPSID>` | - Primary application server instance: 1.5 GB  
- Central services instance: 1.0 GB |
| `/usr/sap/trans` | This value heavily depends on the use of your SAP system. For production systems, we recommend to use as much free space as available (at least 2.0 GB), because the space requirement normally grows dynamically. For the installation, it is sufficient to use 200 MB for each SAP system instance. You can enlarge the file system afterwards. |

#### Logically Shared Directories

SAPinst creates the directory `/usr/sap/<SAPSID>/SYS` on each host. The subdirectories contain symbolic links to the corresponding subdirectories of `/<sapmnt>/<SAPSID>` on the first installation host, as shown in the figure above.

Whenever a local instance is started, the sapcpe program checks the executables against those in the logically shared directories and, if necessary, replicates them to the local instance.

#### Local Directories (SAP System)

The directory `/usr/sap/<SAPSID>` contains files for the operation of a local instance as well as symbolic links to the data for one system.

This directory is physically located on each host in the SAP system and contains the following subdirectories:

- **SYS**

  ![Note]

  The subdirectories of `/usr/sap/<SAPSID>/SYS` have symbolic links to the corresponding subdirectories of `/<sapmnt>/<SAPSID>`, as shown in the figure above.

- `<INSTANCE>` for each instance installed on the host

  The instance-specific directories have the following names:

  - The directory both of the primary application server instance and of an additional application server instance is called `J<Instance_Number>`.
  
  - The directory of the central services instance is called `SCS<Instance_Number>`.

  ![Only valid for: HA (UNIX)]

  - The directory of the Enqueue Replication Server instance is called `ERS<Instance_Number>`.

  ![End of: HA (UNIX)]
### 3.7 Setting Up File Systems and Raw Devices

<table>
<thead>
<tr>
<th>Directory</th>
<th>Required Disk Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>/usr.sap/&lt;SAPSID&gt;</td>
<td>Primary application server instance or additional application server instance: 2.5 GB</td>
</tr>
</tbody>
</table>

#### Local Directories (Diagnostics Agent)

The directory `/usr/sap/<SMDSID>` contains files for the operation of a local Diagnostics Agent instance.

This directory is physically located on each host in the SAP system and contains the following subdirectories:

- **exe**
  - Contains the following global scripts:
    - `smdstart.sh`
      - This script is used to start one or more Diagnostics Agent(s) available in the system landscape.
    - `smdstop.sh`
      - This script is used to stop one or more Diagnostics Agent(s) available in the system landscape.
    - `smdadmin.sh`
      - This script is used to manage one or more Diagnostics Agent(s) available in the system landscape.

- **<INSTANCE>**
  - The directory of the Diagnostics Agent is called J<Instance_Number>
  - This directory contains the Instance-specific data of the Diagnostics Agent.
  - Contains the following subdirectories:
    - `profile`
      - Contains the `smd.properties` file
    - `sapinst`
      - Contains log files of the installation
    - `script`
      - Contains the following local scripts:
        - `smdstart.sh`
          - This script is used to start the local Diagnostics Agent.
        - `smdstop.sh`
          - This script is used to stop the local Diagnostics Agent.
        - `smdadmin.sh`
          - This script is used to manage the local Diagnostics Agent.
    - `SMDAgent`
      - Contains the Diagnostics Agent software and properties files.
    - `work`
      - This is the work directory of the Diagnostics Agent
SYS
- profile

Contains the profiles of the Diagnostics Agent instance

<table>
<thead>
<tr>
<th>Directory</th>
<th>Required Disk Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>/usr/sap/&lt;SMDSID&gt;/J&lt;instance_number&gt;</td>
<td>500 MB</td>
</tr>
<tr>
<td>/usr/sap/&lt;SMDSID&gt;/SYS/profile</td>
<td></td>
</tr>
<tr>
<td>/usr/sap/&lt;SMDSID&gt;/exe</td>
<td></td>
</tr>
</tbody>
</table>

### 3.7.2 Host Agent Directories

For the host agent, the following directories are required:

<table>
<thead>
<tr>
<th>Directories</th>
<th>Description</th>
<th>Required Disk Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>/usr/sap/hostctrl</td>
<td>Contains the following directories:</td>
<td>70 MB</td>
</tr>
<tr>
<td></td>
<td>- exe</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contains the profile</td>
<td></td>
</tr>
<tr>
<td></td>
<td>host_profile</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Working directory of the host agent</td>
<td></td>
</tr>
</tbody>
</table>

Only valid for: HA (UNIX)

### 3.7.3 Setting Up File Systems for a High-Availability System

When you prepare a high-availability (HA) installation with switchover software, you need to set up your file systems as described here. For more information, consult your HA partner.

**Prerequisites**

You have already installed the hardware — that is, hosts, disks, and network — and decided how to distribute the database, SAP instances, and (if required) Network File System (NFS) server over the cluster nodes (that is, over the host machines). For more information, see *Planning the Switchover Cluster* [page 31].

**Procedure**

1. Create the file systems or raw partitions for the central services instance on shared disks. For more information, see *Setting Up File Systems and Raw Devices* [page 71].
Note
The directories /sapmnt/<SAPSID> and /usr/sap/trans have to be mounted from a Network File System (NFS). However, /usr/sap/<SAPSID>/<INSTTYPE><NR>, which should be part of a cluster, has to be a directory of the application server instance that is always mounted on the cluster node currently running the instance (not with NFS).
Therefore, if the host running the primary application server instance is not the NFS server host, you might have to mount the file systems for /sapmnt/<SAPSID> and /usr/sap/trans on different physical disks from the file system for /usr/sap/<SAPSID>/<INSTTYPE><NR>.

2. Use the following approach for the file system for the /usr/sap/<SAPSID> directory:
The /usr/sap/<SAPSID> directory contains at least two subdirectories:
- SYS, which contains links to the central directory /sapmnt/<SAPSID>
- <INSTTYPE><NR> — where the name is defined by the type of services and the application server number, for example SCS<NR> — which contains data for the local Java central services instance.
Only the latter directory needs to be migrated with the application server instance during the switchover. Since the SYS subdirectory contains only links that do not require any space, you can create it locally on each cluster node. Other local instances can also reside locally, such as an Enqueue Replication Server instance in /usr/sap/<SAPSID>/ERS<NR>, which should not be affected by a switchover.
Therefore, instead of /usr/sap/<SAPSID>, create a file system for /usr/sap/<SAPSID>/<INSTTYPE><NR> with the usual <> substitutions.
The instance-specific directory name for the central services instance is normally SCS<NR>.
Migrating only this directory avoids mount conflicts when switching over to a node on which another AS instance is already running. The SCS<NR> directory can join the /usr/sap/<SAPSID> tree instead of mounting on top of it.

Note
This approach becomes increasingly important when you want to cluster the central services instances with other local instances running on the cluster hosts outside the control of the switchover software. This applies to the Enqueue Replication Server (ERS) and additional ABAP or Java application server instances. The result is a more efficient use of resources. You must use this approach for integrated installations of the application server with ABAP and Java stacks.

3. You assign the local file systems to mount points.
4. You assign the shared file systems to mount points in appropriate failover groups.

Example
The graphic below shows an example of the file systems and disks in an HA setup
Note that this is only an example. For more information on a setup that meets your needs, consult your HA partner.
3.7.4 Configuring Network File System for a High-Availability System

If required, you configure Network File System (NFS), which is a system-wide Single Point-of-Failure (SPOF), for a high-availability (HA) installation with switchover software. For more information, consult your HA partner. We regard NFS as an extension to the operating system. The switchover product protects NFS and makes it transparently available to the SAP system in switchover situations.

You need to decide:

- How to protect NFS
- Which switchover cluster nodes NFS is to run on

The NFS configuration might depend on your database system. The directories need to be available for the SAP system before and after a switchover.
**Procedure**

1. Check the NFS directories, several of which need to be shared between all instances of a system. These directories are:
   - `/sapmnt/<SID>/profile`
     Contains the different profiles to simplify maintenance
   - `/sapmnt/<SID>/global`
     Contains log files of batch jobs and central SysLog
   - `/usr/sap/trans`
     Contains data and log files for objects transported between different SAP systems (for example, development – integration). This transport directory ought to be accessible by at least one AS instance of each system, but preferably by all.
   - `/sapmnt/<SID>/exe`
     Contains the kernel executables. These executables ought to be accessible on all AS instances locally without having to use NFS. The best solution is to store them locally on all AS instance hosts.

2. Since you can protect NFS by a switchover product, it makes sense to install it on a cluster node. The requirements of your database system might dictate how NFS has to be set up. If required, you can configure the NFS server on the cluster node of the clustered application server instance or the DB.

In both cases the NFS clients use the virtual IP address to mount NFS. If the second node is used as an additional SAP instance during normal operation (for example, as an additional application server instance), it also needs to mount the directories listed above from the primary node.

When exporting the directories with their original names, you might encounter the problem of a “busy NFS mount” on the standby node. You can use the following workaround to solve this problem:

   a) On the primary server, mount the disks containing the directories:

      `/export/usr/sap/trans`
      `/export/sapmnt/<SID>`

   b) The primary server creates soft links to the directories with the original SAP names:

      `/usr/sap/trans` → `/export/usr/sap/trans`
      `/sapmnt/<SID>` → `/export/sapmnt/<SID>`

      Alternatively the primary server can also mount the directories:

      `/export/usr/sap/trans` → `/usr/sap/trans`
      `/export/sapmnt/SID` → `/sapmnt/<SID>`

   c) The primary server exports:

      `/export/usr/sap/trans`
      `/export/sapmnt/<SID>`

   d) The standby NFS mounts:

      from virt.IP:/export/usr/sap/trans to `/usr/sap/trans`
      from virt.IP:/export/sapmnt/<SID> to `/sapmnt/<SID>`
If the primary node goes down and a switchover occurs, the following happens:

- These directories on the standby node become busy:
  
  /usr/sap/trans
  /sapmnt/<SID>

- The standby node mounts disks to:
  
  /export/usr/sap/trans
  /export/sapmnt/<SID>

- The standby node configures the virtual IP address virt.IP

- The standby node exports:
  
  /export/usr/sap/trans
  /export/sapmnt/<SID>

- These directories on the standby node are accessible again:
  
  /usr/sap/trans
  /sapmnt/<SID>

End of: HA (UNIX)

| Only valid for: AIX |

### 3.7.5 Setting Up File Systems and Raw Devices for AIX

#### Setting up File Systems

1. Create one logical volume for each file system listed in the appropriate SAP profile:
   
   a) Using SMIT, choose | Physical & Logical Storage | Logical Volume Manager | Logical Volumes | Add a Logical Volume |

   b) Enter a volume group name, for example, sapr3vg.

   c) Enter a logical volume name, for example, lvsap01.

   d) Enter the number of logical partitions.


2. Create the file systems.
   

   If you want to use large enabled file systems for files larger than 2 GB, you have to choose Add a Large File Enabled Journaled File System instead of Add a Standard Journaled File System.

   If you want to use JFS2 file systems, you have to choose Enhanced Journaled File System instead of Journaled File System.

   b) To get a list of logical volumes, choose [F4].
3.8 Exporting and Mounting the Global Transport Directory

In your SAP system landscape, a global transport directory for all SAP systems is required. During the installation, you can select the check box SAP System will be under NW DI control on the screen NW DI Landscape. Then SAPInst copies all SCAs belonging to the software units that you installed to the global transport directory.

For more information, see the SAP Library [page 14]:
- Administrator’s Guide ➤ Software Life Cycle Management ➤ Software Logistics ➤ Using the Development and Production Infrastructure

- If the global transport directory already exists, make sure that it is exported on the global transport directory host and mount it on the SAP instance installation host.
- If the global transport directory does not exist, proceed as follows:
  - Create the transport directory (either on the host where the primary application server instance is running or on a file server).
  - Export it on the global transport directory host.
  - If you did not create the transport directory on your SAP instance installation host, mount it there.

Exporting the Transport Directory

1. Log on as user root to the host where the global transport directory /usr/sap/trans resides.
2. Make sure that /usr/sap/trans belongs to the group sapsys and to the user root.
3. If not already done, export the directory using Network File System (NFS).

Mounting the Transport Directory

Note

If the transport directory resides on your local SAP instance installation host, you do not need to mount it.
3.9 Exporting and Mounting Directories via NFS for AIX (Optional)

There are two ways of mounting directories via NFS:

- Manually
- Using the System Management Interface Tool (SMIT)

Procedure

To mount directories via NFS from the host where the directory to be mounted resides:

1. Log on as user root.
2. To start NFS services at the host where the directory to be mounted resides, use SMIT as follows:
   a) Enter the command smitty.
   b) Choose Communications Applications and Services \NFS Network File System (NFS) \Configure NFS on this System \Start NFS.
   c) In the line Start NFS now, on system restart or both, enter: both.
   d) Choose ENTER.
3. Export the directory (for example <sapmnt>/<SAPSID>/exe) with read or read-write access for the host where the additional instance runs:
   a) Enter the command smitty.
   b) Choose Communications Applications and Services \NFS Network File System (NFS) \Add a Directory to Exports List.
   c) Enter the path of the directory that you want to export (for example, <sapmnt>/<SAPSID>/exe).
3.10 Exporting and Mounting Directories via NFS for z/OS

Before you use NFS on z/OS, follow the configuration instructions in 'SAP Planning Guide: DB2 for z/OS' 'NFS Setup'.

3.11 Generating the SAP Solution Manager Key

You need to generate the Solution Manager key because the installation tool prompts for it during the installation. Without this key, the installation process cannot continue. For more information, see SAP Note 805390.
3 Preparing the Installation DVDs

Procedure

1. If SAP Solution Manager is not yet available in your system landscape, proceed as follows:
   a) Order SAP Solution Manager as described in SAP Note 628901.
   b) Install SAP Solution Manager as described in the documentation Installation Guide — SAP Solution Manager <release> on <OS>: <Database> which is available at:
      http://service.sap.com/solutionmanager SAP Solution Manager Installation Guides Release 4.0

2. Generate the SAP Solution Manager key as described in SAP Note 811923.

Result

The SAP Solution Manager system displays the key for which you are prompted during the installation of your SAP system.

3.12 Preparing the Installation DVDs

This section describes how to prepare the installation DVDs, which are available as follows:

- You normally obtain the installation DVDs as part of the installation package.
- You can also download the installation DVDs from SAP Service Marketplace, as described at the end of this section.

1. Identify the required DVDs for your installation [page 18] as listed below.

Keep them separate from the remaining DVDs as this helps you to avoid mixing up DVDs during the installation.

Note

- The media names listed in the following table are abbreviated.
- You can find the Software Component Archives (SCAs) for the installation of SAP NetWeaver usage types on the NetWeaver Java DVD.

<table>
<thead>
<tr>
<th>SAP Instance Installation</th>
<th>Required DVDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central services instance (SCS)</td>
<td>• Installation Master DVD</td>
</tr>
<tr>
<td></td>
<td>• NetWeaver Java DVD</td>
</tr>
<tr>
<td></td>
<td>• Kernel DVD</td>
</tr>
<tr>
<td>Database instance</td>
<td>• Installation Master DVD</td>
</tr>
<tr>
<td></td>
<td>• Kernel DVD</td>
</tr>
<tr>
<td></td>
<td>• Export DVD</td>
</tr>
<tr>
<td></td>
<td>• DB2 DRIVER FOR ODBC AND CLI, V9</td>
</tr>
<tr>
<td>HA only: Enqueue Replication Server</td>
<td>• Installation Master DVD</td>
</tr>
<tr>
<td></td>
<td>• Kernel DVD</td>
</tr>
</tbody>
</table>
### SAP Instance Installation | Required DVDs
--- | ---
| Primary application server instance | • Installation Master DVD<br>• NetWeaver Java DVD<br>• Kernel DVD |
| Additional application server instance | • Installation Master DVD<br>• NetWeaver Java DVD<br>• Kernel DVD |
| Host Agent (Standalone) | • Installation Master DVD<br>• Kernel DVD |

2. Make the required installation media available on each installation host.

![Only valid for: AIX]

If you need information about how to mount DVDs on AIX, see *Mounting a CD / DVD for AIX* [page 131].

![End of: AIX]

**Note**

Depending on your installation type, one or more instances can reside on the same host. You need to keep this in mind when you make the required installation media available on each installation host.

For a standard system, you need to make all required installation media available on the single installation host.

Use one of the following methods to make DVDs available:
- **Before** the installation, copy DVDs manually to local hard disks.
- **During** the installation, use the SAPinst Media Browser dialog and copy the entire DVDs to the path you entered in the *Copy To* column.

![Caution]

- Mount the DVDs locally. We do not recommend you to use Network File System (NFS), because reading from DVDs mounted with NFS might fail.
- If you copy the DVDs to disk, make sure that the paths to the destination location of the copied DVDs do not contain any blanks.
- If you perform a local installation and there is only one DVD drive available on your installation host, you must copy at least the Installation Master DVD to the local file system.

**Downloading Installation DVDs from SAP Service Marketplace (Optional)**

You normally obtain the installation DVDs as part of the installation package from SAP. However, you can also download installation DVDs from SAP Service Marketplace at:
1. Create a download directory on the host where you want to run SAPinst.
2. Identify all download objects that belong to one installation DVD according to one or both of the following:
   - Material number
     All download objects that are part of an installation DVD have the same material number and an individual sequence number:
     `<material_number>_<sequence_number>`
   - Title
     All objects that are part of an installation DVD have the same title, such as `<solution>_<DVD_name>_<OS>` or `<database>_<RDBMS>_<OS>` for RDBMS DVDs.
3. Download the objects to the download directory.
4. Extract the individual download objects using SAPCAR, starting with the lowest sequence number – for example `5103L387_1`, then `5103L387_2`, and so on.
   During the download SAPCAR sets up the structure of the installation DVD.

Note
SAPCAR asks if you want to replace existing files, for example `LABELIDX.ASC`. Always accept with **Yes**.
3.13 Preparing z/OS for SAPinst

If you want to install the ASCS or SCS instance on z/OS – which is the procedure that we recommend for a high-availability system – you need to **prepare z/OS for SAPinst**. This includes installing the Java Runtime Environment Version 1.5 (JRE), which is required both for SAPinst and the SAPinst GUI.

**Note**
If required, you can perform a remote installation using a standalone SAPinst GUI on a separate Windows or UNIX host. This lets you perform the installation on a remote host, controlling it with the SAPinst GUI from a local host.

If you want to perform a remote installation, see *Performing a Remote Installation with SAPinst* [page 99]. In this case, you need at least JRE on the local host so that you can start the SAPinst GUI on that host.

**Procedure**

1. Check the JRE versions that are released for SAP systems in the Product Availability Matrix (PAM):
   b) Choose **SAP NETWEAVER** ➔ **SAP NetWeaver <version>** in the selection tree in the right screen area.
   c) Choose the product version in the left screen area, if applicable
   d) Choose the **JSE Platforms** tab page.
2. Make sure a valid JRE version is installed:
   - If the JRE is not already installed, you need to download and install it.

   **Note**
   JRE is not part of the SAP shipment, it is part of the JDK (Java Development Kit).

   - If the JRE is already installed, check the installed version of JRE by entering the following:

     ```java -version```

   **Note**
   SAPinst checks environment variable **SAPINST_JRE_HOME** for a valid Java runtime environment. If **SAPINST_JRE_HOME** is not found, SAPinst also checks **JAVA_HOME**.
This page is intentionally left blank.
4 Installation

Installation Steps for a Standard System

1. You run `SAPinst` [page 93] to install the SAP system.
2. You continue with `Post-Installation` [page 113].

Installation Steps for a High-Availability System

1. If you want to share the transport directory `trans` from another system, you have to `mount` [page 81] it from this system. Otherwise we recommend that you share the `trans` directory that is created during the installation of the primary application server instance (see below).
2. You set up the switchover cluster infrastructure as follows:
   a) You run `SAPinst` [page 93] to install the central services instance (SCS) using the virtual host name [page 92] on the primary cluster node, host A.
   b) You prepare the standby cluster node, host B, making sure that it meets the hardware and software requirements [page 44] and it has all the necessary file systems [page 76], mount points, and (if required) Network File System (NFS).
   c) You set up the user environment on the standby node, host B.
      For more information, see Creating Operating System Users and Groups [page 62]. You make sure that you use the same user and group IDs [page 62] as on the primary node. You create the home directories of users and copy all files from the home directory of the primary node.
   d) You configure the switchover software and test that switchover functions correctly to all standby nodes in the cluster.
   e) You perform the switchover to a node where you want to install the enqueue replication server (ERS).
   f) You run `SAPinst` [page 93] to install the enqueue replication server (ERS).
   g) You repeat the previous two steps for all nodes in the cluster.
3. You export global directories [page 91] in `<sapmnt>/<SAPSID>` to the database host and to the primary application server instance host.
4. On the database instance host, you do the following:
   a) You make available the global directories in `<sapmnt>/<SAPSID>` from the switchover cluster infrastructure and — optionally — from the SAP transport host.
   b) You run `SAPinst` [page 93] to install the database instance on the database instance host.
5. On the primary application server instance host, you do the following:
Note

In a high-availability installation, the primary application server instance does not need to be part of the cluster because it is no longer a single point of failure (SPOF). The SPOF is now in the central services instance (SCS), which is protected by the cluster.

a) You mount the global directories [page 91] in <sapmnt>/<SAPSID> that you exported from the switchover cluster infrastructure.

b) You run SAPInst [page 93] to install the primary application server instance.

c) If you want to use the shared transport directory trans from another system, you also mount [page 81] this directory (see above).

6. We recommend you to install additional application server (AS) instances with SAPInst to create redundancy.

Since the AS instances are not a SPOF, you do not need to include these instances in the cluster.

7. You continue with Post-Installation [page 113].

Installation Steps for an Additional Application Server Instance

Installation Steps for Additional Application Server Instance(s) for a Standard System

1. On the main host on which your SAP system runs, you export global directories in <sapmnt>/<SAPSID> to the database and primary application server instance host.

2. On every additional application server instance host, you do the following:

   a) You mount the global directories [page 91] in <sapmnt>/<SAPSID> that you exported from the SAP global host.

   b) You run SAPInst [page 93] to install the additional application server instance.

3. You continue with Post-Installation [page 113].

Installation Steps for an Application Server Instance for a Distributed System

1. If you want to share the transport directory trans from another system, you have to mount [page 81] it from this system. Otherwise we recommend that you share the trans directory that is created during the installation of the primary application server instance.

2. On the SAP global host, you export global directories in <sapmnt>/<SAPSID> to the database and primary application server instance host.

3. On every additional application server instance host, you do the following:

   a) You mount the global directories [page 91] in <sapmnt>/<SAPSID> that you exported from the SAP global host.

   b) You run SAPInst [page 93] to install the additional application server instance.

   c) If you want to use the shared transport directory trans from another system, also mount [page 81] this directory.

4. You continue with Post-Installation [page 113].
Installation Steps for an Additional Application Server Instance for a High-Availability System

1. If you want to share the transport directory `trans` from another system, you have to `mount` [page 81] it from this system. Otherwise we recommend that you share the `trans` directory that is created during the installation of the primary application server instance.

2. On the primary node, host A, of the switchover cluster infrastructure, you export global directories in `<sapmnt>/<SAPSID>` to every additional application server instance host.

3. On every additional application server instance host, you do the following:
   a) You `mount` the global directories [page 91] in `<sapmnt>/<SAPSID>` that you exported from the SAP global host.
   b) You `run SAPinst` [page 93] to install the additional application server instance.
   c) If you want to use the shared transport directory `trans` from another system, you also `mount` [page 81] this directory.

4. You continue with Post-Installation [page 113].

Installation Steps for Additional Components and Tools for SAP NetWeaver CE (Optional)

- You install additional components [page 108] for SAP NetWeaver Composition Environment, such as:
  - Composition Tools
  - Adobe Document Services
  - Composite Voice
  - IDE Update Site

Installation Steps for a Standalone Host Agent

1. You `run SAPinst` [page 93] to install the host agent.
2. You continue with Post-Installation [page 113].

4.1 Exporting and Mounting Global Directories

If you install a database or an additional application server instance on a host other than the SAP Global host, you must mount global directories from the SAP Global host.

**Prerequisites**

If you want to install the executables locally instead of sharing them, do not `mount` the `exe` directory with Network File System (NFS). Instead, create `<sapmnt>/<SAPSID>/exe` as a local directory (not a link) with a minimum of 1.5 GB free space.
4. Installation

4.2 Specifying the Virtual Host Name

**Procedure**

1. Log on to the SAP Global host as user root and export the following directories with root access to the host where you want to install the new instance:

   `<sapmnt>/<SAPSID>/exe`
   `<sapmnt>/<SAPSID>/profile`
   `<sapmnt>/<SAPSID>/global`

   (Only valid for AIX)

   For more information, see *Mounting Directories via NFS for AIX* [page 82].

   **End of AIX**

   Make sure that the user root of the host where the additional application server instance runs can access the exported directories.

   Make sure that the user root of the host where you want to install the new instance can access the exported directories.

2. Log on to the host of the new instance that you want to install as user root.

3. Create the following mount points and mount them from the SAP Global host:

   `<sapmnt>/<SAPSID>/exe`
   `<sapmnt>/<SAPSID>/profile`
   `<sapmnt>/<SAPSID>/global`

**4.2 Specifying the Virtual Host Name**

If you want to use a virtual host name, you can set the environment variable `SAPINST_USE_HOSTNAME` to specify the virtual host name before you start SAPinst.

You can also specify the virtual host name by *starting SAPinst* [page 93] with an equivalent parameter in the command line.

**Procedure**

Set `SAPINST_USE_HOSTNAME` to the virtual host name of the machine on which you are installing an SAP instance as follows:

<table>
<thead>
<tr>
<th>Shell Used</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bourne shell (sh)</td>
<td><code>SAPINST_USE_HOSTNAME=&lt;directory&gt;</code></td>
</tr>
<tr>
<td></td>
<td><code>export SAPINST_USE_HOSTNAME</code></td>
</tr>
<tr>
<td>C shell (csh)</td>
<td><code>setenv SAPINST_USE_HOSTNAME &lt;directory&gt;</code></td>
</tr>
<tr>
<td>Korn shell (ksh)</td>
<td><code>export SAPINST_USE_HOSTNAME=&lt;directory&gt;</code></td>
</tr>
</tbody>
</table>

**More Information**

For more information about the use of virtual TCP/IP host names, see SAP Note 962955.
4.3 Running SAPinst

This procedure tells you how to install an SAP system with SAPinst. SAPinst includes a SAPinst GUI and a GUI server, which both use Java.

If you need to see the installation on a remote display, we recommend you perform a remote installation with SAPinst [page 99], where SAPinst GUI is running on a separate host from SAPinst and the GUI server. Alternatively you can use an X Server for Microsoft Windows or other remote desktop tools like vncviewer or nxserver/nxclient offered by various vendors (or OpenSource) for the Remote Access of SAPinst GUI on Windows Workstations. We recommend you use the Hummingbird Exceed X Server which we use ourselves to validate installations with SAPinst.

Note the following information about SAPinst:

- SAPinst normally creates the installation directory sapinst_instdir directly below the temporary directory. SAPinst finds the temporary directory by checking the value of the TEMP, TMP, or TMPDIR environment variable. If no value is set for these variables, SAPinst uses /tmp as default installation directory.

  If you want to use an alternative installation directory, set the environment variable TEMP, TMP, or TMPDIR to the required directory before you start SAPinst.

Recommendation

We recommend that you keep all installation directories until the system is completely and correctly installed.

- SAPinst creates a subdirectory for each installation option called <sapinst_instdir>/<installation_option_directory>.

- The SAPinst Self-Extractor extracts the SAPinst executables to the temporary directory. These executables are deleted again after SAPinst has stopped running. Directories called sapinst_exe.xxxxx.xxxxx sometimes remain in the temporary directory. You can safely delete them.

  The temporary directory also contains the SAPinst Self-Extractor log file dev_selfex.out, which might be useful if an error occurs.

Caution

If SAPinst cannot find a temporary directory, the installation terminates with the error FCO-00058.

- During the installation, the default ports 21200, 21212, and 4239 are used for communication between SAPinst, GUI server, SAPinst GUI and HTTP server. SAPinst uses port 21200 to communicate with the GUI server. The GUI server uses port 21212 to communicate with SAPinst GUI. 4239 is the port of the HTTP server, which is part of the GUI server. You get an error message if one of these ports is already in use by another service.
In this case, you must execute sapinst using the following parameters:

SAPINST_DIALOG_PORT=<free_port_number_sapinst_to_gui_server>
GUISERVER_DIALOG_PORT=<free_port_number_gui_server_to_sapinst_gui>
GUISERVER_HTTP_PORT=<free_port_number_http_server>.

- To get a list of all available SAPinst properties, start SAPinst as described above with the option `-p`:
  ```
  ./sapinst -p
  ```
- If required, you can terminate SAPinst and the SAPinst Self-Extractor by pressing `Ctrl` + `C`.

### Using SAPinst GUI

The following table shows the most important functions that are available in SAPinst GUI:

<table>
<thead>
<tr>
<th>Input Type</th>
<th>Label</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function key</td>
<td>F1</td>
<td>Displays detailed information about each input parameter</td>
</tr>
<tr>
<td>Menu option</td>
<td>File Exit</td>
<td>Stops the SAPinst GUI, but SAPinst and the GUI server continue running</td>
</tr>
</tbody>
</table>
| Menu option      | SAPinst Log Browser | Displays the Log Viewer dialog  
|                  |             | This dialog enables you to access the following log files directly:  
|                  |             | - Installation log (sapinst_dev.log)  
|                  |             | - Log files from the SAPinst GUI server                                   |
| Menu option      | SAPinst Cancel | Cancels the installation with the following options:  
|                  |             | - Stop  
|                  |             |  
|                  |             | - Stops the installation (SAPinst GUI, SAPinst and the GUI server) without further changing the installation files.  
|                  |             | - You can restart and continue the installation later from this point.  
|                  |             | - Continue  
|                  |             | - Continues the installation                                                 |
| Message button   | Retry       | Performs the installation step again (if an error has occurred)             |
| Message button   | Stop        | Stops the installation without further changing the installation files  
|                  |             | You can continue the installation later from this point.                    |
| Message button   | Continue    | Continues with the option you have chosen before                             |
Prerequisites

- Make sure that your operating system does not delete the contents of the temporary directory `/tmp` or the contents of the directories to which the variables `TEMP`, `TMP`, or `TMPDIR` point, for example by using a `crontab` entry.
- Make sure that the temporary directory has the permissions 777.

- Make sure that you have at least 300 MB of free space in the installation directory for each installation option. In addition, you need 300 MB free space for the SAPinst executables. If you cannot provide 300 MB free space in the temporary directory, you can set one of the environment variables `TEMP`, `TMP`, or `TMPDIR` to another directory with 300 MB free space for the SAPinst executables.

You can set values for the `TEMP`, `TMP`, or `TMPDIR` environment variable as follows:

<table>
<thead>
<tr>
<th>Shell Used</th>
<th>Command</th>
</tr>
</thead>
</table>
| Bourne shell (sh) | `TEMP=<directory>
export TEMP` |
| C shell (csh)     | `setenv TEMP <directory>`     |
| Korn shell (ksh)  | `export TEMP=<directory>`     |

- Make sure that your `DISPLAY` environment variable is set to `<host_name>:0.0`, where `<host_name>` is the host on which you want to display the SAPinst GUI.

You can set values for the `DISPLAY` environment variables as follows:

<table>
<thead>
<tr>
<th>Shell Used</th>
<th>Command</th>
</tr>
</thead>
</table>
| Bourne shell (sh) | `DISPLAY=<host_name>:0.0
export DISPLAY` |
| C shell (csh)     | `setenv DISPLAY <host_name>:0.0` |
| Korn shell (ksh)  | `export DISPLAY=<host_name>:0.0` |

- Make sure that you have checked the following values for user `root`:
  - In `csh` execute `limit`

<table>
<thead>
<tr>
<th>Output</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>cputime</td>
<td>unlimited</td>
</tr>
<tr>
<td>filesize</td>
<td>unlimited</td>
</tr>
<tr>
<td>datasize</td>
<td>2097148 KB</td>
</tr>
<tr>
<td>stacksize</td>
<td>8192 KB</td>
</tr>
<tr>
<td>coredumpsize</td>
<td>unlimited</td>
</tr>
<tr>
<td>descriptors</td>
<td>8192</td>
</tr>
<tr>
<td>memorysize</td>
<td>unlimited</td>
</tr>
</tbody>
</table>
In **sh** or **ksh** execute **ulimit -a**

<table>
<thead>
<tr>
<th>Output</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>time(seconds)</td>
<td>unlimited</td>
</tr>
<tr>
<td>file(blocks)</td>
<td>unlimited</td>
</tr>
<tr>
<td>data(kbytes)</td>
<td>2097148</td>
</tr>
<tr>
<td>stack(kbytes)</td>
<td>8192</td>
</tr>
<tr>
<td>coredump(blocks)</td>
<td>unlimited</td>
</tr>
<tr>
<td>nofiles(descriptors)</td>
<td>8192</td>
</tr>
<tr>
<td>memory(KBytes)</td>
<td>unlimited</td>
</tr>
</tbody>
</table>

If your parameter settings differ from the settings above, change these values accordingly.

**Example**

If you have to change the value for descriptors to **8192**, proceed as follows:

- In **csh** execute:
  ```
  limit descriptors 8192
  ```
- In **sh** or **ksh** execute:
  ```
  ulimit -n 8192
  ```

Make sure that you have installed DB2 for z/OS. For information on that installation, see [SAP DBA Guide: DB2 for z/OS] DB2 Setup &, especially the section *Stored Procedures Enablement*.

Only valid for: **z/OS**

Before you start SAPinst, you must set your **SAPINST_JRE_HOME**. For more information, see *Preparing z/OS for SAPinst* [page 87].

End of: **z/OS**

Create a user ID on your database server (z/OS). It must be the same as the name of the Java schema that you specify during the installation. This user ID is used as the owner of all Java database objects.

Make sure that you have defined the most important SAP system parameters as described in *Basic SAP System Parameters* [page 36] before you start the installation.

Check that your installation host(s) meets the requirements for the installation option(s) that you want to install. For more information, see *Running the Prerequisite Checker* [page 46].

Before starting the installation process, make sure that the database is up and running and that the DB2 Connect instance is installed correctly.

For more information, see *Installation of Multiple Components in One Database* [page 29].

**Procedure**

1. Log on to your host as user **root**.
4.3 Running SAPinst

⚠️ Caution
Make sure that the root user has not set any environment variables for a different SAP system or database.

Only valid for: HA (z/OS)

💡 Note
When installing on z/OS, refer to [http://service.sap.com/securityguide] SAP NetWeaver <version> DB and OS Platform Security Guides > SAP Security Guide for IBM DB2 for z/OS > Security Settings for z/OS > section User ID to Install an SAP Central Services Instance on z/OS for more information on which user you must set and which environment is necessary.

End of: HA (z/OS)

2. If you want to install a primary application server instance, a central services instance, a database instance, or an additional application server instance, mount the Installation Master DVD. Mount the DVDs locally. We do not recommend that you use Network File System (NFS), because reading from DVDs mounted with NFS might fail.

Only valid for: AIX

For more information about mounting DVDs, see Mounting a CD / DVD for AIX [page 131].

End of: AIX

3. Start SAPinst from the Installation Master DVD by entering the following commands:
   ```
   cd <mountpoint_of_Installation_Master_DVD>/DATA_UNITS/IM_<OS>_<_DB>
   ./sapinst
   ```

💡 Example
For example, if the mountpoint of the Installation Master DVD is sapcd2, the operating system is LINUX_X86_64 and the database is Oracle, the commands are as follows:
   ```
   cd /sapcd2/DATA_UNITS/IM_LINUX_X86_64_ORA
   ./sapinst
   ```

Only valid for: HA (UNIX)

💡 Note
If you want to use a virtual host name and you have not already set the environment variable SAPINST_USE_HOSTNAME [page 92] to specify the virtual host name, start SAPinst as follows:
   ```
   ./sapinst SAPINST_USE_HOSTNAME=<<virtual host name>>
   ```

End of: HA (UNIX)
4. In the Welcome screen, choose the required SAPinst installation option from the tree structure. For more information, see SAPinst Installation Options [page 106].

5. Follow the instructions in the SAPinst input dialogs and enter the required parameters.

To find more information on each parameter during the input phase of the installation, position the cursor on the required parameter and press [F1].

After you have entered all requested input parameters, SAPinst displays the Parameter Summary screen. This screen shows both the parameters that you entered and those that SAPinst set by default. If required, you can revise the parameters before starting the installation.

6. To start the installation, choose Start.

SAPinst starts the installation and displays the progress of the installation. When the installation has successfully completed, SAPinst shows the dialog Execution of <option_name> has been completed successfully.

7. If required, delete directories with the name sapinst_exe.xxxxx.xxx after SAPinst has finished. Sometimes these remain in the temporary directory.

If there are errors with SAPinst Self-Extractor, you can find the Self-Extractor log file dev_selfex.out in the temporary directory.

We recommend that you keep all installation directories until you are sure that the system is completely and correctly installed.

We recommend you to delete all files in the directory <user_home>/sdtgui/.
9. If you have copied installation DVDs to your hard disk, you can delete these files when the installation has successfully completed.

More Information
- Interrupted Installation with SAPinst [page 134]
- Entries in the Services File Created by SAPinst [page 136]
- Troubleshooting with SAPinst [page 137]

4.4 Performing a Remote Installation with SAPinst (Optional)

You use this procedure to install your SAP system on a remote host. In this case, SAPinst and the GUI server run on the remote host, and SAPinst GUI runs on the local host. The local host is the host from which you control the installation with SAPinst GUI.

Prerequisites
- The remote host meets the prerequisites before starting SAPinst [page 93].
- Both computers are in the same network and can “ping” each other.

To test this:
  - Log on to your remote host and enter the command ping <local host>.
  - Log on to the local host and enter the command ping <remote host>.

Procedure
1. Log on to your remote host as user root.

Caution
Make sure that the root user has not set any environment variables for a different SAP system or database.

2. Mount the Installation Master DVD.
3. Enter the following commands:
   
   cd <mountpoint_of_Installation_Master_DVD>/IM_<OS>_<DB>
   ./sapinst -nogui

Example
For example, if the mount point of the Installation Master DVD is sapcd2, the operating system is LINUX_X86_64 and the database is Oracle, the commands are as follows:

   cd /sapcd2/DATA_UNITS/IM_LINUX_X86_64_ORA
   ./sapinst -nogui
4.5 Interrupted Installation with SAPinst

For more information, see Running SAPinst [page 93]. SAPinst now starts and waits for the connection to the SAPinst GUI. You see the following at the command prompt:

guengine: no GUI connected; waiting for a connection on host <host_name>, port <port_number> to continue with the installation.

4. Start SAPinst GUI on your local host as described in Starting SAPinst GUI Separately [page 102].
5. Log on to your remote host as user root.

⚠️ Caution

Make sure that the root user has not set any environment variables for a different SAP system or database.

6. Mount the Installation Master DVD.
7. Enter the following commands:

```bash
  cd <Installation_Master_DVD>/IM_<OS>
  ./sapinst -nogui
```

For more information, see Running SAPinst [page 93]. SAPinst now starts and waits for the connection to the SAPinst GUI. You see the following at the command prompt:

```bash
  guengine: no GUI connected; waiting for a connection on host <host_name>, port <port_number> to continue with the installation.
```

8. Start SAPinst GUI on your local host as described in Starting SAPinst GUI Separately [page 102].

4.5 Interrupted Installation with SAPinst

The SAP system installation might be interrupted for one of the following reasons:

- An error occurred during the dialog or processing phase:
  SAPinst does not abort the installation in error situations. If an error occurs, the installation pauses and a dialog box appears. The dialog box contains a short description about the choices listed in the table below as well as a path to a log file that contains detailed information about the error.

- You interrupted the installation by choosing Exit in the SAPinst menu.

The following table describes the options in the dialog box:
4.5  Interrupted Installation with SAPinst

<table>
<thead>
<tr>
<th>Option</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Retry</strong></td>
<td>SAPinst retries the installation from the point of failure without repeating any of the previous steps. This is possible because SAPinst records the installation progress in the <code>keydb.xml</code> file. We recommend that you view the entries in the log files, try to solve the problem and then choose <strong>Retry</strong>. If the same or a different error occurs again, SAPinst displays the same dialog box again.</td>
</tr>
<tr>
<td><strong>Stop</strong></td>
<td>SAPinst stops the installation, closing the dialog box, the SAPinst GUI, and the GUI server. SAPinst records the installation progress in the <code>keydb.xml</code> file. Therefore, you can continue the installation from the point of failure without repeating any of the previous steps. See the procedure below.</td>
</tr>
<tr>
<td><strong>Continue</strong></td>
<td>SAPinst continues the installation from the current point.</td>
</tr>
</tbody>
</table>

**Note**
You can also terminate SAPinst by choosing `Ctrl` + `C` However, we do not recommend that you use `Ctrl` + `C` because this kills the process immediately.

**Procedure**
This procedure describes the steps to restart an installation, which you stopped by choosing **Stop**, or to continue an interrupted installation after an error situation.

1. Log on to your local UNIX host as user **root**.

   **Caution**
   Make sure that the **root** user has not set any environment variables for a different SAP system or database.

2. Mount your Installation Master DVD.

   **Note**
   Mount the DVD locally. We do not recommend using Network File System (NFS).

3. Enter the following commands:

   ```bash
cd <mountpoint_of_Installation_Master_DVD>/DATA_UNITS/IM_<OS>_<DB>
./sapinst
```
4.6 Starting SAPinst GUI Separately (Optional)

You use this procedure to start SAPinst GUI separately. You might need to start SAPinst GUI separately in the following cases:

- You have logged off from SAPinst.
  
  If you logged off during the installation and you later want to reconnect to the installation while it is still running, you can start SAPinst GUI separately.

- You want to perform a remote installation [page 99].
  
  If SAPinst GUI runs on a different host from SAPinst and the GUI server, you have to start SAPinst GUI separately.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run a new Installation</td>
<td>SAPinst does not continue the interrupted installation. Instead, it moves the content of the old installation directory and all installation-specific files to the backup directory. Afterwards, you can no longer continue the old installation. For the backup directory, the following naming convention is used: <code>&lt;log_day_month_year_hours_minutes_seconds&gt;</code> (for example, <code>log_01_Oct_2003_13_47_56</code>).</td>
</tr>
<tr>
<td>Continue old installation</td>
<td>SAPinst continues the interrupted installation from the point of failure.</td>
</tr>
</tbody>
</table>

Prerequisites

| End of: z/OS |
Starting SAPinst GUI on Windows

1. Log on as a member of the local administrators group.
2. Insert the SAP Installation Master DVD into your DVD drive.
3. Change to the directory of the sapinst executables:
   
   `<DVD drive>:\DATA_UNITS\IM_WINDOWS_<platform>_<DB>`

   **Note**
   If you want to start SAPinst GUI on a Windows 32-bit operating system, change to the following directory:

   `<Installation_Master_DVD>\DATA_UNITS\SAPINSTGUI_710_WINDOWS_I386`

   Only valid for: AIX;HP-UX;IBM i5/OS;Linux;Solaris;Windows

4. Start SAPinst GUI by double-clicking `sapinstgui.exe`

   SAPinst GUI starts and tries to connect to the GUI server and SAPinst, using the local host as default.

   If SAPinst and the GUI server are running on another host, SAPinst GUI cannot connect and the `SAP Installation GUI Connection` dialog appears.

   In this case, enter the name of the host on which SAPinst is running and choose `Log on`.

   The first dialog of the installation appears and you can perform the remote installation from your local host.

   **Note**
   Optionally you can start `sapinstgui.exe` with the following parameters:

   - `host=<host name>`, where `<host name>` is the host name of the installation host
   - `port=<nr>`, where `<nr>` is the port number for the connection to the GUI server
   - `-accessible` enables the Accessibility mode

   Example:

   `./sapinstgui.exe host=lsi1209 port=3000 -accessible`

   End of: AIX;HP-UX;IBM i5/OS;Linux;Solaris;Windows

   Only valid for: z/OS

5. Start SAPinst GUI in one of the following ways:

   - If SAPinst GUI runs on the same host as SAPinst and the GUI server, enter the following command:

     `startinstgui.bat`

     SAPinst GUI uses the local host as default.

   - If SAPinst and the GUI server runs on a different host from SAPinst GUI (remote installation), enter the following command:

     `startinstgui.bat -host <host_name>`

     `<host_name>` is the host name of the installation host.
4.6 Starting SAPinst GUI Separately (Optional)

**Note**
- If you enter the command without additional parameters, SAPinst GUI uses the local host as default. SAPinst GUI starts and tries to connect to the GUI server and SAPinst. Since SAPinst and the GUI server are running on another host, SAPinst GUI cannot connect and the **SAP Installation GUI Connection** dialog appears.
  - In this case, enter the name of the host on which SAPinst is running and choose **Log on**. The first dialog of the installation appears and you can perform the remote installation from your local host.
- For a list of options to start SAPinst GUI, change to the same directory as your SAPinst executable and enter the command:
  ```
  startinstgui.bat -h
  ```

**End of: z/OS**

### Starting SAPinst GUI on UNIX

1. Log on as user **root**.

**Caution**
Make sure that the root user has not set any environment variables for a different SAP system or database.

2. Mount your Installation Master DVD.

**Note**
Mount the DVD locally. We do **not** recommend that you use Network File System (NFS).

3. Change to the directory of the sapinst executables:
   ```
   <mountpoint_of_Installation_Master_DVD>/DATA_UNITS/IM_<OS>_<DB>
   ```

**Note**
If you want to start SAPinst GUI on a Linux 32-bit operating system, change to the following directory:
```
<mountpoint_of_Installation_Master_DVD>/DATA_UNITS/SAPINSTGUI_710_LINUX_I386
```

*Only valid for: AIX-HP-UX;IBM i5/OS;Linux;Solaris;Windows*

4. Start SAPinst GUI by executing **./sapinstgui**
   - SAPinst GUI starts and tries to connect to the GUI server and SAPinst, using the local host as default.
   - If SAPinst and the GUI server are running on another host, SAPinst GUI cannot connect and the **SAP Installation GUI Connection** dialog appears.
   - In this case, enter the name of the host on which SAPinst is running and choose **Log on**.
The first dialog of the installation appears and you can perform the remote installation from your local host.

**Note**

Optionally you can start `sapinstgui` with the following parameters:
- `host=<host name>`, where `<host name>` is the host name of the installation host
- `port=<nr>`, where `<nr>` is the port number for the connection to the GUI server
- `- accessible` enables accessibility mode

Example:

```
./sapinstgui host=ls1209 port=3000 -accessible
```

End of: AIX,HP-UX,IBM i5/OS;Linux;Solaris;Windows

Only valid for: z/OS

5. Start the SAPinst GUI in one of the following ways:

- If SAPinst GUI runs on the same host as SAPinst and the GUI server, enter the following command **without** additional parameters:
  
  ```bash
  ./startInstGui.sh
  ```

  By default SAPinst GUI uses the local host.

- If SAPinst and the GUI server run on a different host from SAPinst GUI (remote installation), enter the following command **with** additional parameters:
  
  ```bash
  ./startInstGui.sh -host <host_name>
  ```

  `<host_name>` is the host name of the installation host

**Note**

- If you enter the command without additional parameters, SAPinst GUI uses the local host as default. SAPinst GUI starts and tries to connect to the GUI server and SAPinst. Since SAPinst and GUI server are running on another host, SAPinst GUI cannot connect and the **SAP Installation GUI Connection** dialog appears.

  In this case, enter the name of host on which SAPinst is running and choose **Log on**.

  The first dialog of the installation appears and you can perform the remote installation from your local host.

- For a list of options to start SAPinst GUI, change to the same directory as your SAPinst executable and enter the command:
  
  ```bash
  ./startInstGui.sh -h
  ```

End of: z/OS
4.7 SAPinst Installation Options

This section provides information about the following in SAPinst:

- **Installation Options**
- **Software Life-Cycle Options**

**Note**

- Choose the required installation options from the tree structure **exactly** in the order they appear for each system variant.
- If you want to use global accounts, which are configured on separate hosts, you must run the installation option **Operating System Users and Groups before** you start the installation of the SAP system (see table **Software Life-Cycle Options** below).
- If required, install an additional application server instance for a standard system by choosing:
  
  - <SAP System> ➤ Software Life-Cycle Options ➤ Additional Application Server Instances ➤ Additional application server instance 🟢.
- If required, install additional CE components by choosing:
  
  - <SAP System> ➤ Software Life-Cycle Options ➤ Additional CE Components ➤ Additional CE components 🟢.
- If required, install SAP Memory Analyzer by choosing:
  
  - <SAP System> ➤ Software Life-Cycle Options ➤ SAP Memory Analyzer ➤ SAP Memory Analyzer 🟢.

**Installation Options**

You choose SAP Systems with <your database> to install a SAP system with usage types or software units.

You can install the following system variants:

- **Standard System**

**Installation Options for a Standard System**

<table>
<thead>
<tr>
<th>Installation Option</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| **Standard System**  | Installs a complete SAP system including the following instances on one host:  
  - Central services instance (SCS)  
  - Primary application server instance  
  You can install a standard system in the following modes:  
  - Typical Mode  
    If you choose Typical, the installation automatically uses default settings. You only have to respond to a small selection of prompts. However, you can change any of the default settings on the parameter summary screen.  
  - Custom Mode  
    If you choose Custom, the installation prompts you for all parameters. At the end, you can change any parameter on the parameter summary screen.  
  | Caution  
  The database is always installed on z/OS. |
### Installation Option | Remarks
--- | ---
Note | You require at least usage type AS Java or AS ABAP. You can choose the usage types or software units on the next screen.

| Only valid for: HA (MSCS); HA (UNIX); HA (z/OS) |
--- | ---

#### High-Availability System

Installation Options for a High Availability System

| Installation Options       | Remarks                                                                 |
--- | ---                                                                                                                                 |
Central Services Instance (SCS) | Installs a central services instance (SCS) |
Database Instance           | Installs a database instance                                      |
Enqueue Replication Server Instance | Installs an enqueue replication server, which contains a replica of the lock table (replication server) |
Note | Make sure that you have configured the SCS instance for the switchover cluster before starting this installation option. |
Primary Application Server Instance | Installs a primary application server instance and enables additional usage types or software units |
Additional Application Server Instance | Installs an additional application server instance |

| End of: HA (MSCS); HA (UNIX); HA (z/OS) |
--- | ---

#### Software Life-Cycle Options
You use the options located in this folder to perform the following tasks or to install the following components:

| Installation Option | Remarks                                                                 |
--- | ---                                                                                                                                 |
Additional Preparations | Host Agent
Choose [Additional Preparations Host Agent Host Agent] to install the host agent with the profiles SAPSystem=99 and SAPSystemName=SAP.
The host agent contains all of the required elements for centrally monitoring any host.
Normally you do not need to install a standalone host agent, because it is automatically installed during the installation of all SAP NetWeaver components, except TREX.
You only need to install a standalone host agent when: |
<table>
<thead>
<tr>
<th>Installation Option</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>You want to centrally monitor a host that does not have an SAP component. You want to perform an upgrade to SAP NetWeaver. For more information, see Standalone Host Agent [page 22].</td>
<td></td>
</tr>
<tr>
<td>Operating system users and groups</td>
<td>Lets you use global accounts that are configured on a separate host.</td>
</tr>
<tr>
<td><strong>Caution</strong></td>
<td>Perform this SAPinst option before you start the installation of your SAP system.</td>
</tr>
<tr>
<td>Prerequisites check</td>
<td>Choose Additional Preparations Prerequisites Check if you want to check your hardware and software requirements before you start the installation. Otherwise, SAPinst automatically checks the hardware and software requirements during the installation with the Prerequisite Checker. If any changes are necessary to the SAP system or operating system settings, SAPinst automatically prompts you. For more information, see Running the Prerequisites Checker in Standalone Mode [page 46].</td>
</tr>
</tbody>
</table>

### 4.8 Installing Additional Components (Optional)

You can install the following additional components:

- **Composition Tools**
4.8 Installing Additional Components (Optional)

- Adobe Document Services (if available for your platform)
- Composite Voice
- IDE Update Site

**Prerequisites**

You need to fulfill the same hardware and software requirements as for your already installed production system plus an additional 2 GB RAM. The Composition Tools and Composite Voice component make use of the Visual Composer. Visual Composer is a Web browser based tool to model user interfaces. To run Visual Composer, the following programs must be installed on the client computer from which you access Visual Composer:

- Microsoft Internet Explorer 6.0 SP1 or higher
- Adobe SVG Viewer 3.0
- Microsoft XML Parser 4.0 or higher

**Note**

- Before installing additional components, you need to stop all application servers manually.
- Before installing additional components and in the case that you made changes to the default template settings, see **SAP Note 953763**.

**Procedure**

**Note**

When installing from a network share make sure that everyone has read access to this share. The installation routine creates users such as `<sid>adm` (for example, `ce1adm`). During the installation SAPinst does a user switch to this user. If the newly created user does not have permissions to the network share where the installation is running from, the installation will fail.

1. Insert the SAP Installation Master DVD into your DVD drive or mount it locally.
2. Run **SAPinst** [page 93].
3. In the Welcome screen, choose `SAP NetWeaver CE Productive System` `Software Life-Cycle Actions` `Additional CE Components` `Install Additional Components`.
4. Choose whether you want to run the installation in **Typical** mode or in **Custom** mode.

   If you select **Typical**, the installation wizard provides automatic default settings and you only have to respond to a small selection of prompts. The rest is set by default. If you select **Custom**, you have to respond to all prompts.
4.9 Installing SAP Memory Analyzer (Optional)

SAP Memory Analyzer helps you to analyze Java heap dumps, easily find big chunks of memory or complex memory aggregation patterns in your data structures and identify who is keeping this memory alive. New and innovative analysis techniques support the user with a fast and powerful feature set.

The tool (Eclipse RCP application) was developed to analyze real productive heap dumps, which tend to get enormous in size with hundreds of millions of objects. Performance, low resource consumption and especially the newly developed innovative analysis techniques make it a helpful tool, even to small application heap dumps.

You can install SAP Memory Analyzer as an additional tool.

Note
If you want to install the offline documentation for SAP NetWeaver CE, you need to choose Custom mode.
After the installation, you can access the offline documentation by choosing Start &gt; All Programs &gt; SAP NetWeaver Composition Environment &gt; &lt;SAPSID&gt; &gt;.

5. Follow the screens and enter the required parameters.

Note
For more information about the input parameters and information about restrictions for passwords, position the cursor on the required parameter and press F1.

After you have entered all requested input parameters, SAPinst displays the Parameter Summary screen. This screen shows both the parameters that you entered and those that SAPinst set by default. If required, you can revise the parameters before starting the installation.

6. To start the installation, choose Start. SAPinst starts the installation and displays the progress of the installation. When the installation has successfully been completed, SAPinst shows the dialog Execution of &lt;Option_Name&gt; has been completed successfully.

Note
After installing additional components, you need to perform CE-specific post-installation activities [page 123] to get the system up & running.
### Procedure

**Note**
When installing from a network share make sure that *everyone* has read access to this share. The installation routine creates users such as `<sid>adm` (for example, `co1adm`). During the installation SAPInst performs a user switch to this user. If the newly created user does not have permissions to the network share where the installation is running from, the installation will fail.

1. Insert the SAP Installation Master DVD into your DVD drive or mount it locally.
2. Run SAPInst [page 93].
3. In the Welcome screen, choose `SAP NetWeaver CE Productive System` ➔ `Software Life-Cycle Options` ➔ `SAP Memory Analyzer` ➔ `Install SAP Memory Analyzer` ➔.
4. Choose whether you want to run the installation in *Typical* mode or in *Custom* mode.
   - If you select *Typical*, the installation wizard provides automatic default settings and you only have to respond to a small selection of prompts. The rest is set by default. If you select *Custom*, you have to respond to all prompts.

**Note**
If you want to install the offline documentation for SAP NetWeaver CE, you need to choose *Custom* mode.
After the installation, you can access the offline documentation by choosing `Start` ➔ `All Programs` ➔ `SAP NetWeaver Composition Environment` ➔ `<SAPSID>` ➔.

5. Follow the screens and enter the required parameters.

**Note**
For more information about the input parameters and information about restrictions for passwords, position the cursor on the required parameter and press `F1`.

After you have entered all requested input parameters, SAPInst displays the *Parameter Summary* screen. This screen shows both the parameters that you entered and those that SAPInst set by default. If required, you can revise the parameters before starting the installation.

6. To start the installation, choose *Start*. SAPInst starts the installation and displays the progress of the installation. When the installation has successfully been completed, SAPInst shows the dialog *Execution of <Option_Name> has been completed successfully.*
This page is intentionally left blank.
5 Post-Installation

This section includes the post-installation steps that you have to perform for the:

- Standard or high-availability system
- Additional application server instance
- Standalone host agent

**Standard, Distributed, or High-Availability System**

**Note**
Since an SAP on IBM DB2 for z/OS system is always a distributed constellation, we only offer a **standard** or **high-availability** installation option.

1. If required, you perform a full installation backup [page 125] immediately after the installation has finished.
2. You check whether you can log on to the SAP system [page 114].

**Note**
In a distributed or high-availability system you check whether your can log on to every instance of the SAP system that you installed.

3. You ensure user security [page 115].
4. You install the SAP license [page 117].

*Only valid for: HA (UNIX)*

5. You set up the licenses for high availability [page 120].

*End of: HA (UNIX)*

6. You configure the remote connection to SAP support [page 118].
7. On the primary application server instance host, you apply the latest kernel and Support Packages [page 118].
8. You check the Java manuals [page 121] for information that is relevant for running your Java system.
9. You perform CE-specific post-installation steps [page 123].
10. You perform a full installation backup [page 125].
11. If you want or need to implement the E2E Root Cause Analysis scenario, you have to perform post-installation steps for the Diagnostics Agent [page 127] on your central instance and/or dialog instance(s).

**Additional Application Server Instance**

1. If required, you perform a full installation backup [page 125] immediately after the installation has finished.
2. You check whether you can log on to the additional application server instance [page 114].

3. You perform a full installation backup [page 125].

4. If you want or need to implement the E2E Root Cause Analysis scenario, you have to perform post-installation steps for the Diagnostics Agent [page 127] on your central instance and/or dialog instance(s).

**Standalone Host Agent**

You perform the post-installation steps for the Host Agent [page 121].

### 5.1 Logging On to the Application Server

You need to check that you can log on to the application server using the following standard users:

#### Java Standalone Users

<table>
<thead>
<tr>
<th>User</th>
<th>User Name Storage: Database</th>
<th>User Name Storage: External ABAP System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>Administrator</td>
<td>You create this user manually during the installation process.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recommendation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>We recommend that you call the user J2EE_ADM_&lt;SAPSID_Java_System&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The maximum length is 12 characters.</td>
</tr>
</tbody>
</table>

#### Prerequisites

- The SAP system is up and running.

**Logging On to the Java Application Server**

You access AS Java with a URL using a Web browser from your client machines. To log on to the Java application server, proceed as follows:

1. Start a Web browser and enter the following URL:

   `http://<hostname_of_Java EE_Engine_Server>:5<Instance_Number>00`

**Note**

You must always enter a two-digit number for `<Instance_Number>`. For example, do not enter 1 but instead enter 01.
5.2 Ensuring User Security

You need to ensure the security of the users that SAPInst creates during the installation. For security reasons, you also need to copy the installation directory to a separate, secure location — such as a DVD — and then delete the installation directory.

Recommendation

In all cases, the user ID and password are only encoded when transported across the network. Therefore, we recommend using encryption at the network layer, either by using the Secure Sockets Layer (SSL) protocol for HTTP connections, or Secure Network Communications (SNC) for the SAP protocols dialog and RFC.

For more information, see the SAP Library [page 14]:

Function-Oriented View ➔ Security ➔ Network and Transport Layer Security ➔

Caution

Make sure that you perform this procedure before the newly installed SAP system goes into production.

Prerequisites

If you change user passwords, be aware that SAP system users might exist in multiple SAP system clients (for example, if a user was copied as part of the client copy). Therefore, you need to change the passwords in all the relevant SAP system clients.

Procedure

For the users listed below, take the precautions described in the relevant SAP security guide, which you can find on SAP Service Marketplace at http://service.sap.com/securityguide:
## 5.2 Ensuring User Security

### Operating System Users

<table>
<thead>
<tr>
<th>User Type</th>
<th>User</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system user</td>
<td>&lt;sapsid&gt;adm</td>
<td>SAP system administrator</td>
</tr>
</tbody>
</table>

### Host Agent User

<table>
<thead>
<tr>
<th>User</th>
<th>User Name</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system user</td>
<td>sapadm</td>
<td>SAP system administrator You do not need to change the password of this user after the installation. This user is for administration purposes only.</td>
</tr>
</tbody>
</table>

---

**Note**

You can set up Java standalone users with the SAP User Management Engine (UME) in one of the following ways:

- With the users stored in an external ABAP system — see the first table below
- With the users stored in the database — see the second table below

The next two tables show these ways of managing the users.

### SAP System Users Stored in an External ABAP System

<table>
<thead>
<tr>
<th>User</th>
<th>User Name Storage: External ABAP System</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>You create this user manually in the external ABAP system during the installation process.</td>
<td>This user's password is stored in secure storage. Therefore, whenever you change the administrator’s password, you must also change the password in secure storage with the Config Tool. For more information, see Checking the SAP Java Documentation [page 121].</td>
</tr>
</tbody>
</table>

**Recommendation**

We recommend that you call the user J2EE_ADMIN_<SAPSID_Java_System>

The maximum length is 12 characters.

| Guest | You create this user manually in the external ABAP system during the installation process. | Lock this user for interactive logon. |

**Recommendation**

We recommend that you call the user J2EE_GST_<SAPSID_Java_System>
5 Post-Installation

5.3 Installing the SAP License

<table>
<thead>
<tr>
<th>User</th>
<th>User Name Storage: External ABAP System</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The maximum length is <strong>12</strong> characters.</td>
<td></td>
</tr>
</tbody>
</table>

**Communication user for Application Server Java**

You create this user manually in the external ABAP system during the installation process.

⚠️ Recommendation

We recommend that you call the user `SAPJSF_<SAPSID_Java_System>`
The maximum length is **12** characters.

Specify this user as a Communications user and not as a dialog user.
This user exists at least in the SAP system client that you specified during the installation.

**SAP System Users Stored in the Database**

<table>
<thead>
<tr>
<th>User</th>
<th>User Name Storage: Database</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The name that you gave this user during the installation or the default name <code>Administrator</code></td>
<td>This user’s password is stored in secure storage. Therefore, whenever you change the administrator’s password, you must also change the password in secure storage with the AS Java Config Tool. For more information, see <em>Checking the SAP Java Documentation</em> [page 121].</td>
</tr>
<tr>
<td><strong>Guest</strong></td>
<td>The name that you gave this user during the installation or the default name <code>Guest</code></td>
<td>Lock this user for interactive logon.</td>
</tr>
</tbody>
</table>

### 5.3 Installing the SAP License

You must install a **permanent** SAP license. When you install your SAP system, a **temporary** license is automatically installed. This temporary license allows you to use the system for **only four weeks** from the date of installation.

⚠️ Caution

**Before** the temporary license expires, you must apply for a permanent license key from SAP.
We recommend that you apply for a permanent license key as soon as possible after installing your system.

**Procedure**

For information about the installation procedure for the SAP license, see the *SAP library* [page 14]:

---

**05/16/2008**

**PUBLIC**

**117/158**
5.4 Configuring the Transport Management System

You have to perform some steps to be able to use the Transport Management System.

Procedure

1. Perform post-installation steps for the transport organizer:
   a) Call transaction SE06.
   b) Select Standard Installation.
   c) Choose Perform Post-Installation Actions.
2. Call transaction STMS in your SAP Solution Manager system to configure the domain controller in the Transport Management System (TMS).

Result

You can now perform Java transports in the TMS of your SAP Solution Manager system.

More Information

For more information, see the SAP Library [page 14]:

Function-Oriented View ➤ Application Server ABAP ➤ Administration Tools for AS ABAP ➤ Change and Transport System ➤

5.5 Configuring the Remote Connection to SAP Support

SAP offers its customers access to support and a number of remote services such as the EarlyWatch Service or the GoingLive Service. Therefore, you have to set up a remote network connection to SAP. For more information, see SAP Service Marketplace at http://service.sap.com/remoteconnection.

5.6 Applying the Latest Kernel and Support Packages

You have to apply the latest kernel and Support Packages for your SAP system from SAP Service Marketplace.
Caution
Before you apply support packages, make sure that you read the release notes for your SAP system. You can find these at [http://service.sap.com/releasenotes](http://service.sap.com/releasenotes). The release notes might include information about steps you have to perform after you have applied the support packages.

Caution
Make sure that the entry DIR_CT_RUN exists in the instance profile. Otherwise you cannot restart the system after patches have been applied.

You can use Java Support Package Manager (JSPM) to apply both the latest ABAP+Java or Java kernel and Java support packages.

JSPM is a Java standalone tool that you can use with SAP NetWeaver 7.1. JSPM uses the Software Deployment Manager (SDM) to apply support packages and patches and to deploy software components.

For more information about JSPM and how to use this tool, see the [SAP Library](http://service.sap.com/SDM) [page 14]:

- Administrator’s Guide
- Technical Operations for SAP NetWeaver
- General Administration Tasks
- Software Life-Cycle Management
- Software Logistics
- Application Server Java (AS Java)
- Software Logistics
- Software Maintenance
- Java Support Package Manager (JSPM)

**Procedure**

1. Apply the latest kernel.
   We recommend that you replace the installed kernel with the latest kernel from SAP Service Marketplace. In particular, you should replace the installed kernel if:
   - You installed the kernel executables locally on every host.
   - Your primary application server instance host runs on a different operating system than your additional application server instance host.

   For more information about how to download a kernel, see [SAP Note 19466](https://service.sap.com/SDM).

   To exchange the ABAP+Java kernel, you can use Java Support Package Manager (JSPM).

2. Apply Support Packages.
   a) b) Alternatively, you can download Support Packages from: [http://service.sap.com/patches](http://service.sap.com/patches)
   c) Apply the Java Support Packages to your SAP system with the help of the Java Support Package Manager (JSPM).

   For more information about the availability of Support Packages, see: [http://service.sap.com/ocs-schedules](http://service.sap.com/ocs-schedules)
For more information about how to update your CE system, see the documentation SAP NetWeaver Composition Environment 7.1 — Update Guide SP<xx>, available at http://www.sdn.sap.com/irj/sdn/nw-ce.

Only valid for: HA (UNIX)

5.7 High Availability: Setting Up Licenses

Every SAP system needs a central license, which is determined by the environment of the message server. Since SAP’s high-availability (HA) solution stipulates two or more cluster nodes (host machines) where the message server is enabled to run, you have to order as many license keys [page 117] as you have cluster nodes.

When we receive confirmation from your vendor that you are implementing a switchover environment, we provide the required license keys for your system, one key for each machine. SAP has implemented a license mechanism for transparent and easy use with switchover solutions and clustered environments. Your customer key is calculated on the basis of local information on the message server host. This is the host machine where the central services instance (SCS) runs. There is no license problem when only the database is switched over.

Prerequisites
The SAP system is up and running.

Procedure
1. Make sure that the SCS instance on the primary host, node A, is running.
2. To find the hardware key of the primary host, run the SAP NetWeaver Administrator (NWA) on any application server instance and choose ➔ Configuration Management ➔ Infrastructure Management ➔ Licenses ➔. The hardware key is displayed in the NWA.
3. Perform a switchover of the central services instance (SCS) to another node in the cluster and repeat the previous step.
   Repeat this for all remaining nodes in the cluster.
4. To obtain the two license keys, enter the hardware IDs for the primary and backup hosts at: http://service.sap.com/licensekey
5. To import the files containing the two licenses to the primary cluster node, run the NWA on any application server instance and choose: ➔ Configuration Management ➔ Infrastructure Management ➔ Licenses ➔
6. Perform a switchover of the central services instance (SCS) to another node in the cluster and repeat the previous step.
   Repeat this for all remaining nodes in the cluster.
5.8 Post-Installation Steps for the Host Agent

You have to perform the following steps on each host where the host agent is installed. This applies whether the host agent is installed on a host within the SAP system or standalone on another host.

Procedure

1. You check whether the installed services are available as follows:
   a) Log on as user sapadm.
   b) Check whether the following services are available:
      - The control program saphostexec
      - The operating system collector saposcol
      - The SAP NetWeaver Management agent SAPHostControl (sapstartsrv in host mode)

      ![Note]
      When the host is booted, the startup script sapinit automatically starts the required executables.

2. You configure the host agent according to your requirements.

More Information

For more information, see the SAP Library [page 14]:
Function-Oriented View Application Server ABAP Administration Tools for AS ABAP Monitoring in the CCMS Infrastructure of the SAP NetWeaver Management Agents

5.9 Checking the SAP Java Documentation

Here you can find information in the SAP Library about the configuration of Application Server Java (AS Java) and about SAP Java technology.

Procedure

1. Choose the following in the SAP library [page 14]:
   Function-Oriented View Application Server Java AS Java (Application Server Java)

2. Check the following documentation for information relevant to running your Java system:
<table>
<thead>
<tr>
<th>Manual</th>
<th>Contents</th>
</tr>
</thead>
</table>
| Application Server Infrastructure | This documentation provides an overview of the architecture of the Application Server Java (AS Java). It contains information on:  
  - Java cluster architecture  
  - Application Server Java (AS Java) system architecture  
  - Zero Administration (technical configuration within AS Java) |
| Application Server Java Administration | This documentation describes how to administer the SAP system, focusing on AS Java. It contains information on:  
  - Administration Tools  
    - SAP Management Console  
      The SAP Management Console (SAP MC) provides a common framework for centralized system management. It lets you monitor and perform basic administration tasks on the SAP system centrally, thus simplifying system administration.  
    - SAP NetWeaver Administrator  
      SAP NetWeaver Administrator is a Web-based tool for administration and monitoring that offers a single entry point to configure, administer, and monitor your SAP NetWeaver system, its components, and the applications running on it.  
    - Config Tool  
      The Config Tool provides offline configuration of the SAP NetWeaver Application Server Java (AS Java) instances. It lets you modify the properties of all services, managers, and applications. In addition, it enables you to manage log configurations offline, add filters, and edit the JVM parameters.  
    - Administration Using Telnet  
    - SAP Java Virtual Machine (SAP JVM)  
    - The Startup Framework for AS Java  
    - Administration Functions for Information Lifecycle Management |
| Application Server Java Identity Management of the Application Server Java | Identity Management of the SAP NetWeaver Application Server (AS Java) enables you to manage users and roles for access to applications of the AS Java and the data, which the applications require. The user management engine (UME) provides identity management as a service of the AS Java. This documentation contains information on:  
  - User Management Engine  
  - Authorization Concept of the AS Java  
  - Configuring Identity Management  
  - Administration of Users and Roles |
| SAP High Availability | This documentation contains information on:  
  - Cluster and Load Balancing (AS-Java)  
  - Single points of failure for SAP NetWeaver AS Java |
| Security System Security | This documentation contains information on additional system security functions for AS Java. |
5.10 CE-Specific Post-Installation Activities

This section describes the steps that you have to perform after the installation has finished successfully.

Running the Configuration Wizard (Optional)

**Note**

You can run the configuration wizard **only once** and only **directly after installing and patching** your SAP system.

After SAPinst has finished, run the configuration wizard to apply automated configuration tasks to your system.

For SAP NetWeaver CE, you need to run the following configuration tasks, depending on the installed components:

- Configuration of Services Registry Webservice Destinations
- Configuration and Mirroring of local NWDS Update Site
- Initial setup ADS in CE (if ADS is available on your platform)
- Change Management Service (CMS): Create an Application Skeleton
- Change Management Service (CMS): Modify a Software Component

For more information about how to start the configuration wizard, see the configuration documentation in the SAP Solution Manager.

Enabling Adobe Document Services

If you have installed SAP NetWeaver Composition Environment with the Adobe Document Services add-on on a *Windows* platform, you must complete the following post-installation steps to enable the add-on. In case you have installed an AS Java cluster, apply the procedure to the central host, as well as to all hosts where additional application server instances are running.

1. Using the SAP Management Console, stop the AS Java system.
   
2. From the Start menu, open [Control Panel] 》 Administrative Tools 》 Computer Management 》 Services and Applications 》 Services 》.
3. Select SAP<SID>_<Instance_Number> (for example, SAPCE1_00) and open Properties from the context menu.
4. On the Log On tab page, enable the Local System account indicator.
5. Repeat the above steps for the second SAP<SID>_<Instance_Number> service that you see in the list.
6. Start the AS Java system.
Adobe LiveCycle Designer

For more information about how to install and configure the Adobe LiveCycle Designer see SAP Note 962763.

Enabling Services Registry

You must apply additional configuration steps to enable Services Registry after you have installed an SAP NetWeaver Composition Environment system containing the following components:

- Java Application Server and Composition Platform
- Java Application Server and Adobe Document Services

To enable Services Registry, you must apply the following configuration template to your system:

CE_Complete_Stack_production_full

Note

For more information about what configuration templates are available, see Configuration Templates [page 130].


See also


Configuring the Portal in SAP NetWeaver CE

After installing the portal in SAP NetWeaver CE, a number of deactivated or irrelevant tools are displayed in the UI. To display the correct portals tools for CE, proceed as follows:

1. Open a browser and log on to your portal as an administrator.
2. In the same browser session, enter the following URL:


   where <host> is the host name of your server and <httpport> is the port number of your server.
3. In the Portal Mode Configuration Tool, choose Activate Development Mode to restore the portal tools and content that are assigned to the development mode.
4. Restart or refresh your browser.
5. In the SAP Management Console, restart the server.

You may then continue with the mandatory and optional configuration steps as described in [http://help.sap.com/nwce] SAP NetWeaver Composition Environment Library ➤ Administrator’s Guide ➤
5.11 Performing a Full Installation Backup

You must perform a full offline backup after the configuration of your SAP system. If required, you can also perform a full offline backup after the installation (recommended). In addition, we recommend you to regularly back up your database.

Caution

Make sure that you fully back up your database so that you can recover it later if necessary.

You need to back up the following directories and files:
The DB2 subsystem
For more information, see section Database Administration Backup and Recovery Options in the documentation SAP DBA Guide: DB2 for z/OS at http://service.sap.com/instguides.

Back up the following files for your SAP system:
- /etc/services
- /etc/passwd
- /etc/shadow
- /etc/group
- /usr/sap/sapservices

Caution
You must be careful about which entries you restore in these files.

All SAP-specific directories:
- /usr/sap/<SAPSID>
- /usr/sap/trans
- <sapmnt>/<SAPSID>
- Home directory of the user <sapid>adm

The root file system
This saves the structure of the system and all configuration files, such as file system size, logical volume manager configuration, and database configuration data.

Note
This list is only valid for a standard installation.

Prerequisites
You have logged on as user <sapid>adm and stopped the SAP system and database.

This procedure works on all hardware platforms. For more information about operating system-specific backup procedures, see your operating system documentation.

Backing Up the Installation
1. Log on as user root.
2. Manually create a compressed tar archive that contains all installed files:
   - Saving to tape:
     tar -cf - <file_system> | compress -c > <tape_device>
   - Saving to the file system:
     tar -cf - <file_system> | compress -c > ARCHIVENAME.tar.Z
5.12 Post-Installation Steps for the Diagnostics Agent

Restoring Your Backup
If required, you can restore the data that you previously backed up.

Caution
Check for modifications in the existing parameter files before you overwrite them when restoring the backup.

1. Log on as user root.
2. Go to the location in your file system where you want to restore the backup image.
3. Restore the data with the following commands:
   - From tape:
     ```
     cat <tape_device> | compress -cd | tar -xf -
     ```
   - From the file system:
     ```
     cat ARCHIVENAME.tar.Z | compress -cd | tar -xf -
     ```

5.12 Post-Installation Steps for the Diagnostics Agent

To implement the E2E Root Cause Analysis scenario, you have to configure the Diagnostics Agent.

To implement the E2E Root Cause Analysis scenario, you have to perform the following post-installation steps.

Prerequisites
You have installed an AS Java central instance or dialog instance.

Procedure

1. Upgrade the JDK on AIX and Linux x86_64 operating systems as described in SAP Note 1093831.
   This avoids connection problems between the Diagnostics Agent and the Diagnostics Managing system, as well as out-of-memory errors and class-loader problems.
2. Plan the implementation of the SAP Solution Manager Diagnostics Agent as described in the Root Cause Analysis Installation and Upgrade Guide, which you can find at one of the following:
   ```
   ```
5.12 Post-Installation Steps for the Diagnostics Agent

Plan the implementation of the SAP Solution Manager Diagnostics Agent as described in the *Root Cause Analysis Installation and Upgrade Guide*, which you can find at [http://service.sap.com/diagnostics](http://service.sap.com/diagnostics).

End of: HP-UX;IBM i5/OS;Solaris;Windows;z/OS

End of: AIX;Linux

Only valid for: HP-UX;IBM i5/OS;Solaris;Windows;z/OS
6 Additional Information

Here you find additional information about the installation of your SAP system. There is also information about how to delete an SAP system.

- Transporting Self-Developed Software Component Archives (SCA) into the System [page 129]
- Configuration Templates [page 130]
- Uninstalling SAP NetWeaver Composition Environment [page 131]
  [Only valid for: AIX]
- Mounting a CD / DVD for AIX [page 131].
  [End of: AIX]
- Starting and Stopping the SAP System [page 138]
  [Only valid for: HA (UNIX)]
- High-Availability: Finalizing the enqueue replication server for high availability [page 145].
  You have to perform this procedure only if you have installed the enqueue replication server (ERS) into an existing system.
  [End of: HA (UNIX)]
- Database Build Phase [page 145]
- Database Post Load Phase [page 148]
- saposcol, sapccmsr and SAPCL [page 148]
- Deleting an SAP System [page 149]

6.1 Transporting Self-Developed Software Component Archives (SCA) into the System

**Prerequisites**
You have developed your own Software Component Archives (SCA) and want to transport them into your SAP NetWeaver CE system.

**Procedure**
To transport your SCAs to the SAP NetWeaver CE system, proceed as follows:

2. Log on to your system as user root and, from an empty directory, run the update tool 
   `update<ID>.sh`.

   **Note**
   If the tool displays descriptions such as Applying Support Packages, you can ignore them.

3. In the dialog screens, specify the directory where your SCAs are located.
4. Follow the on-screen instructions.

### 6.2 Configuration Templates

Configuration templates contain the predefined instance configuration for specific scenarios. They 
are automatically applied according to the installation option you have selected. The templates 
are designed to optimize system performance by applying certain configuration to the Java Virtual 
Machine and the application server, as well as by applying startup filters to AS Java services and 
applications to start only those relevant for the selected installation options.

The following table provides information about the available templates with SAP NetWeaver 
Composition Environment. In the template name, replace the `<system_mode>` parameter by 
development (for the templates relevant to systems installed in development mode) or production (for 
the templates relevant to systems installed in productive mode).

<table>
<thead>
<tr>
<th>Configuration Template</th>
<th>Selected Installation Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE_Java_EE_&lt;system_mode&gt;_full</td>
<td>Java Application Server Installation</td>
</tr>
<tr>
<td>CE_Composition_Environment_&lt;system_mode&gt;_full</td>
<td>Java Application Server Installation + Composition Platform Installation</td>
</tr>
<tr>
<td>CE_Adobe_Document_Service_&lt;system_mode&gt;_full</td>
<td>Java Application Server Installation + Adobe Document Services Add-on Installation</td>
</tr>
<tr>
<td>CE_Composite_Voice_&lt;system_mode&gt;_full</td>
<td>Java Application Server Installation + Voice Add-on Installation</td>
</tr>
<tr>
<td>CE_Complete_Stack_&lt;system_mode&gt;_full</td>
<td>Java Application Server Installation + Composition Platform Installation + Adobe Document Services Add-on Installation + Voice Add-on Installation</td>
</tr>
</tbody>
</table>

If your selection cannot be mapped to one of the combinations in the above table, the template 
CE_Complete_Stack_<system_mode>_full is applied. It starts all applications and services needed 
to run the complete stack.

You can manually apply a different configuration template if you want to switch to another installation 
option. For example, by changing from template CE_Complete_Stack_<system_mode>_full to 
CE_Java_EE_<system_mode>_full, you achieve shorter startup times and less memory consumption, 
but also less functionality since not all applications and services are running.
For more information about applying configuration templates, see \[ http://help.sap.com/nwce \] Administrator’s Guide \| Configuration of SAP NetWeaver CE \| Initial System Configuration \| AS Java Configuration \| Activating a Configuration Template \].

**Note**
Make sure that you do not apply a development template to a productive system or vice versa.

### 6.3 Uninstalling SAP NetWeaver Composition Environment

You have to uninstall all components of the SAP NetWeaver Composition Environment separately. You can uninstall your SAP NetWeaver CE system in different ways.

**Uninstalling SAP NetWeaver CE**
Start the uninstallation from the directory `/usr/sap/SID/SYS/exe/uc/<platform>/uninstall`.

**Uninstalling SAP NetWeaver CE Using SAPinst**
1. Insert the SAP Installation Master DVD into your DVD drive or mount it locally.
2. Start SAPinst from the SAP Installation Master DVD as described in the section Installing SAP NetWeaver Composition Environment.
3. In the Welcome screen, choose Uninstall SAP System or Single Instances from the tree structure.
4. Follow the on-screen instructions.

| Only valid for: AIX |

### 6.4 Mounting a CD / DVD for AIX

You can use this procedure to mount a CD or DVD.

**Note**
`<medium-mountdir>` refers to either `<cd-mountdir>` or `<dvd-mountdir>`.

**Procedure**
1. Log on as user root.
2. Add a CD / DVD file system.
   a) Enter the command `smitty`.
   b) Choose \| Physical & Logical Storage \| File Systems \| Add / Change / Show / Delete File Systems \| CDROM File Systems \| Add a CDROM File System \].
6.5 Mounting a CD / DVD on z/OS

Use
SAP code and database system are delivered on CD / DVD. The contents must be accessible by the SAP installation tool and the upgrade programs SAPup (for ABAP) and SAPJup (for Java). This can be achieved either by mounting a CD / DVD drive of a workstation on z/OS via NFS, or by copying the contents to the z/OS file system.

3. Mount the CD / DVD as follows:

a) Enter the command `smitty`.
b) Choose Physical & Logical Storage > File Systems > Mount a File System.
c) Place the cursor on File System Name and choose F4.
d) Select the CD / DVD device /dev/cd0.
e) Place the cursor on field Directory over which to mount and choose F4.
f) Select /sapcd.
g) Place the cursor on field Type of File System and choose F4.
h) Select cdrfs.
i) Change Mount as Read Only system to YES
j) Choose ENTER.
k) To exit smitty, choose F10.

End of: AIX
Procedure

Note
The placeholder `<medium-mountdir>` is used for either `<cd-mountdir>` or `<dvd-mountdir>`.

Using a CD / DVD drive on a UNIX system
On AIX 5.1 or higher you can mount the CD / DVD with option `-o upcase` to produce uppercase file names.
The CD / DVD file system is to be exported for NFS. Make sure that an NFS server is running on the UNIX system.
On z/OS, mount the CD / DVD file system from the UNIX system using the TAG option as described in [SAP Planning Guide: DB2 for z/OS] #NFS Setup #.
If multiple CD / DVD drives (or a jukebox) are available, several CD / DVDs can be mounted at the same time.
The CD / DVD file system is not case sensitive, which means that the files can be accessed in upper or lowercase. SAP utilities always use uppercase names.
Optionally, copy the CD / DVDs to a local z/OS file system. Allow sufficient space for each CD / DVD (approximately 650 MB for a CD and 4.3 GB for a DVD). Before you copy a CD / DVD, make sure that it is mounted on the UNIX system such that files and directories are listed in uppercase characters:
On AIX, use mount option `-o upcase`, for example:
```
mount -o upcase -r -v cdrfs /dev/cd0 /<medium-mountdir>
```
where `/<medium-mountdir>` specifies the mount directory of the CD / DVD.

Using a CD / DVD drive on a Windows system
When using a CD / DVD drive on a Windows system, the following alternatives are available for using the SAP installation tool or upgrade program on z/OS:

- NFS server
- SMB

These two alternatives are described in the following two sections.

NFS server
The Windows system must have third-party software installed that provides the functionality of an NFS server. The z/OS NFS client must be configured. For information on the configuration, see the IBM documentation at [http://publib.boulder.ibm.com/infocenter/zos/v1r9/index.jsp] #NFS (Network File System) #, order number SC26-7417-07. The CD / DVD drive is to be exported on the Windows system and mounted on z/OS.
To mount the CD / DVD, use the TSO `MOUNT` command. Some third-party NFS software products do not properly support the default NFS protocol, version 3. The `MOUNT` command may succeed, but a subsequent `ls` command on a CD / DVD directory may fail, or the `MOUNT` command may fail. In this case, try to mount the CD / DVD with mount option `VERS(2)` as shown in the following example:
Example

MOUNT FILESYSTEM(cdrom)
TYPE(NFS)  MODE(READ)
MOUNTPOINT('/cdrom')
PARM('nthost:D:,VERS(2)')
TAG(TEXT,819)

For information on the setup, see \textit{SAP Planning Guide: DB2 for z/OS \(\rightarrow\) NFS Setup}.\footnote{1}

\textbf{SMB}

For information on \textit{z/OS} software requirements and on the setup, see \textit{SAP Planning Guide: DB2 for \textit{z/OS \(\rightarrow\) SMB Setup}}.\footnote{1}

When using SMB, the CD / DVDs cannot be accessed directly by \textit{z/OS}. Instead, the contents must be copied to the \textit{z/OS} file system.

Provide a directory structure on \textit{z/OS} for a copy of the CD / DVDs. For each CD / DVD, allow for 600 MB space. Define the directories as network share.

On the workstation, map the share as a network drive and copy the CD / DVD with the following command:

\texttt{xcopy <medium drive> <dest> /s /e}

where \texttt{<medium drive>} is the CD / DVD drive and \texttt{<dest>} specifies the destination network drive and path.

\section*{6.6 Additional Information About SAPinst}

The following sections provide additional information about \textit{SAPinst} [page 93]:

- \textit{Interrupted Installation with SAPinst} [page 134]
- \textit{Entries in the Services File Created by SAPinst} [page 136]
- \textit{Troubleshooting with SAPinst} [page 137]

\section*{6.6.1 Interrupted Installation with SAPinst}

The SAP system installation might be interrupted for one of the following reasons:

- An error occurred during the dialog or processing phase:

  SAPinst does not abort the installation in error situations. If an error occurs, the installation pauses and a dialog box appears. The dialog box contains a short description about the choices listed in the table below as well as a path to a log file that contains detailed information about the error.

- You interrupted the installation by choosing \textit{Exit} in the SAPinst menu.

The following table describes the options in the dialog box:
### 6.6 Additional Information About SAPinst

<table>
<thead>
<tr>
<th>Option</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Retry</strong></td>
<td>SAPinst retries the installation from the point of failure without repeating any of the previous steps. This is possible because SAPinst records the installation progress in the <code>keydb.xml</code> file. We recommend that you view the entries in the log files, try to solve the problem and then choose Retry. If the same or a different error occurs again, SAPinst displays the same dialog box again.</td>
</tr>
<tr>
<td><strong>Stop</strong></td>
<td>SAPinst stops the installation, closing the dialog box, the SAPinst GUI, and the GUI server. SAPinst records the installation progress in the <code>keydb.xml</code> file. Therefore, you can continue the installation from the point of failure without repeating any of the previous steps. See the procedure below.</td>
</tr>
<tr>
<td><strong>Continue</strong></td>
<td>SAPinst continues the installation from the current point.</td>
</tr>
</tbody>
</table>

#### Note

You can also terminate SAPinst by choosing **Ctrl** + **C**. However, we do not recommend that you use **Ctrl** + **C** because this kills the process immediately.

#### Procedure

This procedure describes the steps to restart an installation, which you stopped by choosing Stop, or to continue an interrupted installation after an error situation.

1. Log on to your local UNIX host as user root.

   **Caution**
   
   Make sure that the root user has not set any environment variables for a different SAP system or database.

2. Mount your Installation Master DVD.

   **Note**
   
   Mount the DVD locally. We do not recommend using Network File System (NFS).

3. Enter the following commands:
   ```
   cd <mountpoint_of_Installation_Master_DVD>/DATA_UNITS/IM_<OS>_<DB>
   ./sapinst
   ```
Example

For example, if the mount point of the Installation Master DVD is sapcd2, the operating system is LINUX_X86_64 and the database is Oracle, the commands are as follows:

```
cd /sapcd2/DATA_UNITS/IM_LINUX_X86_64_ORA
./sapinst
```

4. From the tree structure in the Welcome screen, select the installation option that you want to continue and choose Next.

Note

If there is only one component to install, the Welcome screen does not appear.

The What do you want to do? screen appears.

5. In the What do you want to do? screen, decide between the following alternatives and confirm with OK.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run a new Installation</td>
<td>SAPinst does not continue the interrupted installation. Instead, it moves the content of the old installation directory and all installation-specific files to the backup directory. Afterwards, you can no longer continue the old installation. For the backup directory, the following naming convention is used: <code>&lt;log_day_month_year_hours_minutes_seconds&gt;</code> (for example, <code>log_01_Oct_2003_13_47_56</code>).</td>
</tr>
<tr>
<td>Continue old installation</td>
<td>SAPinst continues the interrupted installation from the point of failure.</td>
</tr>
</tbody>
</table>

### 6.6.2 Entries in the Services File Created by SAPinst

After the installation has finished successfully, SAPinst has created the following entries in `/etc/services`:

- `sapdpXX = 32XX/tcp`
- `sapdbXXs = 47XX/tcp`
- `sapgwXX = 33XX/tcp`
- `sapgwXXs = 48XX/tcp`

where XX is set from 00 to 99.

Note

If there is more than one entry for the same port number, this is not an error.
6.6.3 Troubleshooting with SAPinst

This section tells you how to proceed when errors occur during the installation with SAPinst. If an error occurs, SAPinst:

- Stops the installation
- Displays a dialog informing you about the error

Procedure

1. To view the log file, choose View Logs.
2. If an error occurs during the dialog or processing phase, do one of the following:
   - Try to solve the problem.
   - Abort the installation with Exit.
     For more information, see Interrupted Installation with SAPinst [page 134].
   - Continue the installation by choosing Retry.
3. Check the log and trace files of the GUI server and SAPinst GUI in the directory <user_home>/sdtgui/ for errors.
   - If GUI server or SAPinst GUI do not start, check the file sdtstart.err in the current <user_home> directory.
   - If SAPinst GUI aborts during the installation without an error message, restart SAPinst GUI as described in Starting SAPinst GUI Separately [page 102].
   - If you use an X Server for Microsoft Windows or other remote desktop tools for the Remote Access of SAPinst GUI on Windows Workstations and you experience display problems such as missing repaints or refreshes, contact the vendor of the X Server that you use for information on whether this X Server support Java Swing-based GUIs and for further requirements and restrictions. See also SAP Note 1170809.

6.7 Heterogeneous SAP System Installation

This section provides information on the installation of an SAP system in a heterogeneous system landscape. “Heterogeneous system landscape” means that application servers run on different operating systems.

Procedure

See SAP Note 1067221 for information on

- supported combinations of operating systems and database systems,
- how to install an application server on Windows in a heterogeneous (UNIX) SAP system environment,
- heterogeneous SAP system landscapes with different UNIX operating systems.
6.8 Starting and Stopping SAP System Instances

You can start and stop SAP system instances and the Diagnostics Agent by using the SAP Management Console (SAP MC) [page 138].

Apart from using the SAP Management Console (SAP MC) you can also use scripts to:

- Start or stop SAP system instances [page 141]
- Start or stop the Diagnostics Agent [page 144].

6.8.1 Starting and Stopping the SAP System Using the SAP Management Console

You can start and stop all SAP system instances using the SAP Management Console (MC) except the database instance. You have to start and stop the database instance as described in Starting and Stopping the SAP System Using startsap and stopsap [page 141].

Note

If your newly installed SAP system is part of a heterogeneous SAP system landscape comprising systems or instances on Windows platforms, you can also start and stop it from a Windows system or instance using the Microsoft Management Console (MMC).

For more information about handling the MMC, see the SAP Library [page 14]:
- Function-Oriented View
- Application Server ABAP
- Administration Tools for AS ABAP
- Monitoring in the CCMS
- SAP Microsoft Management Console: Windows

Prerequisites

- Make sure that the host on which you start SAP MC meets the following requirements:
  - Java Runtime Environment (JRE) 5.0 is installed.
  - The browser supports Java.
  - The browser’s Java plug-in is installed and activated.
- You have logged on to the host as user <sapsid>adm.

Starting the Web-Based SAP Management Console

1. Start a Web browser and enter the following URL:
   
   \[http://<hostname>:5<instance_number>13\]

   Example
   
   If the instance number is 53 and the host name is saphost06, you enter the following URL:
   \[http://saphost06:55313\]

   This starts the SAP MC Java applet.
Note
If your browser displays a security warning message, choose the option that indicates that you trust the applet.

2. Choose Start.
The SAP Management Console appears.

Note
When you start the SAP MC for the first time for a newly installed SAP system, you have to register your system as described in Registering Systems and Instances below. Having done this, the instances installed on the host you have connected to are already added in the SAP Management Console when you start the SAP MC next time.

By default, the instances installed on the host you have connected to are already added in the SAP Management Console.
If you want to change the configuration to display systems and instances on other hosts, see Registering Systems and Instances below.

Starting and Stopping Systems and Instances

Starting an SAP System or Instance
1. In the navigation pane, open the tree structure and navigate to the system node that you want to start.
2. Select the system or instance and then, from the context menu, choose Start.
3. In the Start SAP System(s) dialog box, choose the required options.
4. Choose OK. The SAP MC starts the specified system or system instances.

Note
The system might prompt you for the SAP system administrator credentials. To complete the operation, you must have administration permissions. Log in as user <sapid>adm.

Starting Instances Separately
If you need to start the instances of an SAP system separately, for example when you want to start a distributed or a high-availability system, proceed in the following sequence:
1. Start the database instance.
2. Start the central services instance SCS<Instance_Number>.
3. Start application server instance(s) J<Instance_Number>.

Stopping an SAP System or Instance
1. Select the system or instance you want to stop and choose Stop from the context menu.
2. In the Stop SAP System(s) dialog box, choose the required options.
3. Choose OK. The SAP MC stops the specified system or system instances.

Note

The system might prompt you for the SAP system administrator credentials. To complete the operation, you must have administration permissions. Log in as user <sapsid>adm.

Similarly, you can start, stop or restart all SAP systems and individual instances registered in the SAP MC.

Stopping Instances Separately
If you need to stop the instances of an SAP system separately, for example when you want to start a distributed or a high-availability system, proceed in the following sequence:
1. Stop application server instance(s) J<Instance_Number>.
2. Stop the central services instance SCS<Instance_Number>.
3. Stop the database instance.

Registering Systems and Instances in the SAP Management Console
You can extend the list of systems and instances displayed in the SAP MC, so that you can monitor and administer all systems and instances from a single console. You can configure the SAP MC startup view to display the set of systems and instances you want to manage.

Prerequisites

The SAP MC is started.

Registering SAP Systems

1. In the SAP MC, choose File ➤ New ➤.
2. In the New System dialog box, enter the required data.

Note

If you have already registered systems in the SAP MC, they are stored in the history. To open the System’s History dialog box, choose the browsing button next to the Instance Nr. field. Select an instance of the system that you want to add and choose OK.

3. Choose Finish.

Registering Individual Instances

1. In the SAP MC, choose File ➤ New ➤.
2. In the New System dialog box, enter the required data and deselect Always show all SAP Instances.
3. The SAP MC displays the SAP system node, the instance node and the relevant database node in a tree view in the navigation pane.

Note
To view all instances of the respective SAP system, select the relevant system node and choose Add Application Server from the context menu.

Configuring the SAP MC View

- You can choose the instances that the SAP MC displays automatically on startup:
  1. In the Settings dialog box, select History.
  2. In the right-hand side pane, choose the instance you want the SAP MC to display on startup.
  3. Choose the << button.
  4. Choose Apply and then choose OK.
   Similarly, you can remove instances from the startup configuration.

- You can save the current configuration in a file:
  1. Choose File ➤ Save Landscape ➤.
  2. In the Save dialog box, enter the required data.
  3. Choose Save.

- You can load a configuration from a file:
  1. Choose File ➤ Load Landscape ➤.
  2. In the Open dialog box, select the configuration you want to load.
  3. Choose Open.

More Information
For more information about how to handle the SAP MC, see the SAP Library [page 14]:

6.8.2 Starting and Stopping the SAP System Using Scripts

You can start and stop the SAP system by running the startsap and stopsap scripts.

Prerequisites

- You have checked the default profile /<sapmnt>/<SAPSID>/profile/DEFAULT.PFL for parameter login/system_client and set the value to the correct productive system client. For example, the entry must be login/system_client = 001 if your productive client is 001.
- You have logged on to the SAP system hosts as user <sapid>adm.
- For more information about how to start or stop database-specific tools, see the database-specific information in this documentation and the documentation from the database manufacturer.
If you want to use `startsap` or `stopsap` (for example, in a script) and require the fully qualified name of these SAP scripts, create a link to `startsap` or `stopsap` in the home directory of the corresponding user.

**Caution**

If there are multiple SAP instances on one host – for example, a primary application server instance and an additional application server instance – you must add an extra parameter to the scripts:

```
startsap <instanceID>
stopsap <instanceID>
```

For example, enter:
```
startsap J00
```

**Note**

The instance name (instance ID) of the primary application server instance is `J<Instance_Number>`, the instance name of the central services instance is `SCS<Instance_Number>`, and the instance name of a Java additional application server instance is `J<Instance_Number>`.

Only valid for: HA (UNIX)

In a high-availability system, you must use the failover cluster software of your hardware vendor to start or stop all instances that are running on the switchover cluster. You can only use `startsap` and `stopsap` scripts for instances that are not running on the switchover cluster.

End of: HA (UNIX)

**Procedure**

Starting the SAP system

To start all instances on the **standard system** host, enter the following command:
```
startsap
```

This checks if the database is already running. If not, it starts the database first.

**Note**

You can also use the parameter `J2EE`, which is a synonym for the parameter `R3`.

**Note**

You can also use the parameter `J2EE`, which is a synonym for the parameter `R3`. For ABAP+Java systems, you can enter either the command `startsap R3` or `startsap J2EE` to start the SAP instance comprising both ABAP and Java.
For an **additional application server instance**, enter the following on the relevant host:

```
startsap R3 <instance ID of additional application server instance>
```

**Note**

Make sure that the SAP system is up and running before you start or restart additional application server instances.

### Stopping the SAP System

**Note**

When you use `stopsap` in a Multiple Components in One Database (MCOD) system with two primary application server instances, only one primary application server instance and the database are shut down. Therefore, you must first stop the other SAP system with `stopsap R3` or make sure that it has already been stopped.

For more information, see *Installation of Multiple Components in One Database* [page 29].

If you have a **standard system**, enter the following to stop all instances on the standard system host:

```
stopsap
```

This stops the primary application server instance, central services instance, and database.

**Note**

You can also use the parameter `J2EE`, which is a synonym for the parameter `R3`.

**Note**

You can also use the parameter `J2EE`, which is a synonym for the parameter `R3`.

For ABAP+Java systems, you can enter either the command `stopsap R3` or `stopsap J2EE` to stop the SAP instance comprising both ABAP and Java.

For an **additional application server instance**, enter the following on the relevant host:

```
stopsap R3 <instance ID of additional application server instance>
```

**Note**

Make sure that the SAP system is up and running before you start or restart additional application server instances.
6.8.3 Starting and Stopping the Diagnostics Agent Using Scripts

You can start and stop the Diagnostics Agent by running the `smdstart` and `smdstop` scripts. The local versions of these scripts are located in `/usr/sap/<SMDSID>/J<instance_number>/script`. The global versions of these scripts are located in `/usr/sap/<SMDSID>/exe`.

**Note**

You can only start or stop the Diagnostics Agent separately. It is not started or stopped automatically with the SAP system.

You can also use the SAP Management Console (SAP MC) [page 138] to start or stop the Diagnostics Agent.

**Prerequisites**

You have logged on to the central instance or dialog host as user `<smdsid>adm`.

**Procedure**

**Starting a Diagnostics Agent Locally**

1. Change to the following directory:
   `/usr/sap/<SMDSID>/J<Instance_Number>/script`
2. To start the Diagnostics Agent locally, enter this command:
   `. /smdstart.sh`

**Starting Diagnostics Agent(s) Globally**

To start Diagnostics Agent(s) globally, enter this command:
`smdstart <SMDSID> <Instance_Number>`

**Example**

`smdstart SMD 98`

**Note**

You do not have to specify the `<SMDSID>` if there is only one Diagnostics Agent system on this host.

**Stopping a Diagnostics Agent Locally**

1. Change to the following directory:
   `/usr/sap/<SMDSID>/J<instance_number>/script`
2. To stop the Diagnostics Agent locally, enter this command:
   `./smdstop.sh`
6.9 High Availability: Finalizing the Enqueue Replication Server

Stopping Diagnostics Agent(s) Globally

To stop Diagnostics Agent(s) globally, enter this command:

`smdstop <SMDSID> <Instance_Number>`

**Example**

```
smdstop SMD 98
```

**Note**

You do not have to specify the `<SMDSID>` if there is only one Diagnostics Agent system on this host.

Only valid for: HA (UNIX)

---

**6.9 High Availability: Finalizing the Enqueue Replication Server**

You have to perform this procedure only if you have installed the enqueue replication server (ERS) into an existing system. This is necessary to ensure correct functioning of the ERS, which depends on the switchover software you are using.

**Procedure**

1. Restart the central services instance associated with the ERS.
   This requires you to restart the primary application server and additional application server instance.
2. Contact your hardware partner to configure and test the ERS.

**More Information**

See the SAP Library [Function-Oriented Overview → Application Server Infrastructure → Standalone Enqueue Server → Installing the Standalone Enqueue Server](#)

End of: HA (UNIX)

---

**6.10 Database Build Phase**

**Note**

This section only applies to customers using IBM DB2 for z/OS Version 8.

If you are using DB2 V9.1 z/OS, storage groups, tablespaces and databases are created implicitly.
Database Layout

The DB2 database layout for the SAP system differs considerably from other platforms. This design is described in detail in SAP DBA Guide: DB2 for z/OS Additional Information Database Layout.

The DB2 datasets you use for the DB2 system must be managed by the Storage Management Subsystem (SMS).

Note

You must use SMS in your SAP system. You can no longer use non-SMS managed DB2 datasets.

Changing Primary Quantity and Secondary Quantity

The installation process always adapts the primary and secondary allocation quantities for tablespaces – if they reach a specific maximum or minimum. SAPinst allows you to change these thresholds. The default values are:

- 400 MB for the maximum primary quantity
- 1 MB for the minimum secondary quantity

The following is an example of how this mechanism works:

The size of all tablespaces having a primary allocation size larger than 400 MB is reduced to this maximum. On the other hand, all tablespaces having less than 1 MB are created with a primary quantity of 1 MB.

To change the default thresholds, specify the new values in the dialog Tablespaces.

Note

If you change the values, make sure that you enter the values in MB.

Database Layout Files

The first step of the build phase results in database layout files located in <INSTDIR>. They contain a list of SQL statements that are created by SAPinst.

The database layout files are:

- stogroup.sql
- database.sql
- tblspace.sql_<nn>

where <nn> is a two digit number between 00 and 09.

The following table shows the dependencies between the tablespace page size and the parameters FREEPAGE and PCTFREE. SAPinst creates the CREATE TABLESPACE statements in file tblspace.sql_<nn> accordingly:
### Database Build Phase

<table>
<thead>
<tr>
<th>Tablespace Page Size</th>
<th>FREEPAGE</th>
<th>PCTFREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 KB</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>8 KB</td>
<td>31</td>
<td>10</td>
</tr>
<tr>
<td>16 KB</td>
<td>31</td>
<td>5</td>
</tr>
<tr>
<td>32 KB</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

### Changing the Standard Database Layout

⚠️ **Caution**

Take extreme care if you change database layout files. Only a few checks are made by subsequent installation steps. Otherwise, you may easily corrupt your installation. You **must not** change any tablespace, database, or storage group names.

To change the standard database layout, you have to set the stop flags in the dialog *Checkpoints for Database Layout*.

You can modify primary and secondary quantities, alter buffer pools, or use compression (if this is supported by the system). Before you start, make sure you have a backup copy of your database layout files.

### Executing the Database Layout Files

During the build phase, the statements in the database layout files are executed. Each layout file has a corresponding log file:

- `stogroup.log`
- `database.log`
- `tblspace.log_<nn>`

The database layout files are executed in following sequence:

1. `stogroup.sql`
2. `database.sql`
3. `tblspace.sql_<nn>`

The tablespaces are created in parallel using `db2radm`, which is part of the SAP kernel. The degree of parallelism depends on the number of tablespaces (maximum of 10 at the moment).

If the execution of the database layout files fails, you must proceed as follows:

1. If objects have been incorrectly created, you must drop the database instance using the *Uninstall* function in SAPinst.
2. If all objects created so far are correct, remove the cause of the error and restart SAPinst. Only missing objects are created – existing objects are not changed.
6.11 Database Post Load Phase

After the database load phases are completed, SAPinst performs several DB2-specific steps:

- Creates indexes for the catalog tables SYSIBM.SYSTABLESPACE and SYSIBM.SYSTABLES
- Updates DB2 catalog statistics using RUNSTATS
- Changes the tablespace options LOCKSIZE ROW and LOCKMAX 1000000 for all tablespaces

Creating Catalog Indexes

The indexes for SYSIBM.SYSTABLESPACE and SYSIBM.SYSTABLES are stored in the default stogroup SYSDEFLT. If the volumes in this stogroup are full, you need to add new volumes to this stogroup.

Updating DB2 Catalog Statistics

RUNSTATS is a DB2 utility that gathers summary information about the characteristics of the data in tablespaces, indexes, and partitions. This information is recorded in the DB2 catalog and is used by DB2 to select access paths to data during the bind process. The database administrator can use RUNSTATS for evaluating database design and determining when tablespaces or indexes must be reorganized.

Caution

The installation checks if the IBM DB2 Utilities (RUNSTATS) are installed. (This check only runs if the stored procedures are installed). If RUNSTATS is not installed, you have two options:

- You can skip the execution of RUNSTATS
- You can interrupt SAPinst to install the utilities.
  
  Subsequently, you can restart SAPinst – and RUNSTATS is executed.

Skipping the execution of RUNSTATS means that you have to update the catalog statistics yourself using an equivalent product.

You can update DB2 statistics by calling the DB2 stored procedure DSNACCMO.

For more information, see Stored Procedures Enablement in SAP DBA Guide: DB2 for z/OS.

6.12 saposcol, sapccmsr and SAPCL

- saposcol
The operating system collector `saposco1` provides information that can assist you in detecting resource bottlenecks. `saposco1` gathers data on CPU load, paging activity, and so on. It logs the data in a shared memory segment. The logged data is read by the `SAPCL` program and can be made available to the SAP system using a remote function call (RFC).

- **sapccmsr**
  This tool connects `saposco1` to the SAP application server.
- **SAPCL**
  This stored procedure monitors the performance of the DB2 database.

### More Information

- For more information about how to install `saposco1`, see the *SAP Planning Guide: DB2 for z/OS*.
- For more information and on how to install `sapccmsr`, see the *Monitoring Setup Guide for NW <version>.*
- For more information and on how to install `SAPCL`, see the *SAP DBA Guide: DB2 for z/OS.*

### 6.13 Deleting an SAP System

This section describes how to delete a single instance, a standalone engine or a complete SAP system with the *Uninstall* option of SAPInt.

When you uninstall an SAP system, the database content is also deleted.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>With this SAPInt option you do <strong>not</strong> delete the database software.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>You cannot delete an SAP system remotely, with one exception: the database instance host is deleted remotely.</td>
</tr>
</tbody>
</table>

### Prerequisites

- This description assumes that you have installed your SAP system with standard SAP tools according to the installation documentation.
- You are logged on as user `root`.
- If the `saposco1` process on the host where you are working has been started from the SAP system that you want to delete, stop the process using the command `saposco1 -k`.

If there are other SAP systems on the host, log on as user `<sapsid>adm` of the other SAP system and start `saposco1` from there using the command `saposco1 -I`. 
Procedure

1. Start SAPinst [page 93] and on the Welcome screen, choose:
2. Follow the instructions in the SAPinst input dialogs.

Note
For more information about the input parameters, place the cursor on the relevant field and press [F1] in SAPinst.

SAPinst first asks you which SAP instances you want to delete. Make sure that you delete the SAP instances in the order as described hereinafter.

- If you want to delete a standard system, in which all SAP instances reside on the same host (except for the database instance), you can do this in one SAPinst run.
- If you want to delete a high availability system, in which the SAP instances reside on different hosts, you have to run SAPinst to delete the required instances locally on each host in the following sequence:

Note
If you have your SCS or ASCS instance on z/OS, you must delete these manually.

a) You must delete the database instance first.
   Use the following option to delete the database instance:

Uninstall in SAPinst

<table>
<thead>
<tr>
<th>Options</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| Uninstall| Select this option if you want to delete the database content.  
**Procedure**  
A) Select Uninstall, and the Remove Database screen appears.  
B) Select Remove Database or Parts to remove the database. |

Caution
Deleting a database is an irreversible action. All objects belonging to <schema> in the DB2 subsystem are lost.

- After you have deleted the database, delete all SAP instances.
- Alternatively, you can consider deleting and recreating the DB2 subsystem. Refer to the IBM DB2 for z/OS documentation for more information.

b) You delete the additional application server instance(s), if there are any.
c) You delete the primary application server instance.
6.14 Deleting the Database Instance

⚠️ Caution
Keep in mind that deleting a database instance is an irreversible action. All objects belonging to `<schema>` in the DB2 subsystem are lost after this.

Prerequisites
Before deleting the database, you must stop all SAP instances belonging to this database.

Procedure
To delete the database instance:

1. Log on as user `<sapsid>adm`.
2. Stop all application servers connected to the z/OS database server using `stopsap`.
3. Log on as user `root` and change to the `<INSDIR>`
4. Start SAPinst.
5. Start the installation script `sapinst` from the following directory:
   
   `<SAP Installation Master DVD>/IM<x>`


7. Answer all questions on the screens that follow carefully.

⚠️ Caution
After you have deleted the database, delete all SAP instances.

Alternatively, you can consider deleting and recreating the DB2 subsystem. Refer to the IBM DB2 for z/OS documentation for more information.
## Typographic Conventions

<table>
<thead>
<tr>
<th>Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; &gt;</td>
<td>Angle brackets indicate that you replace these words or characters with appropriate entries to make entries in the system, for example, “Enter your <code>&lt;User Name&gt;</code>”.</td>
</tr>
<tr>
<td>Arrows</td>
<td>Arrows separating the parts of a navigation path, for example, menu options</td>
</tr>
<tr>
<td>Example</td>
<td>Emphasized words or expressions</td>
</tr>
<tr>
<td>Example</td>
<td>Words or characters that you enter in the system exactly as they appear in the documentation</td>
</tr>
<tr>
<td>Example</td>
<td>Textual cross-references to an internet address, for example, <a href="http://www.sap.com">http://www.sap.com</a></td>
</tr>
<tr>
<td>/example</td>
<td>Quicklinks added to the internet address of a homepage to enable quick access to specific content on the Web</td>
</tr>
<tr>
<td>123456</td>
<td>Hyperlink to an SAP Note, for example, SAP Note <a href="http://www.sap.com">123456</a></td>
</tr>
<tr>
<td>Example</td>
<td>Words or characters quoted from the screen. These include field labels, screen titles, pushbutton labels, menu names, and menu options.</td>
</tr>
<tr>
<td>Example</td>
<td>Cross-references to other documentation or published works</td>
</tr>
<tr>
<td>Example</td>
<td>Output on the screen following a user action, for example, messages</td>
</tr>
<tr>
<td>Example</td>
<td>File and directory names and their paths, names of variables and parameters, and names of installation, upgrade, and database tools</td>
</tr>
<tr>
<td>EXAMPLE</td>
<td>Technical names of system objects. These include report names, program names, transaction codes, database table names, and key concepts of a programming language when they are surrounded by body text, for example, <code>SELECT</code> and <code>INCLUDE</code></td>
</tr>
<tr>
<td>EXAMPLE</td>
<td>Keys on the keyboard</td>
</tr>
</tbody>
</table>
No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP AG. The information contained herein may be changed without prior notice.

Some software products marketed by SAP AG and its distributors contain proprietary software components of other software vendors.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP AG. The information contained herein may be changed without prior notice.

Some software products marketed by SAP AG and its distributors contain proprietary software components of other software vendors.

Microsoft, Windows, Excel, Outlook, and PowerPoint are registered trademarks of Microsoft Corporation.

IBM, DB2, DB2 Universal Database, OS/2, Parallel Sysplex, MVS/ESA, AIX, S/390, AS/400, OS/390, OS/400, iSeries, pSeries, xSeries, zSeries, System i, System i5, System p, System p5, System z, System z9, z/OS, AFP, Intelligent Miner, WebSphere, Netfinity, Tivoli, Informix, i5/OS, POWER, POWER5, POWER5+, OpenPower and PowerPC are trademarks or registered trademarks of IBM Corporation.

Adobe, the Adobe logo, Acrobat, PostScript, and Reader are either trademarks or registered trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Oracle is a registered trademark of Oracle Corporation.

UNIX, X/Open, OSF/1, and Motif are registered trademarks of the Open Group.

Citrix, ICA, Program Neighborhood, MetaFrame, WinFrame, VideoFrame, and MultiWin are trademarks or registered trademarks of Citrix Systems, Inc.

HTML, XML, XHTML and W3C are trademarks or registered trademarks of W3C®, World Wide Web Consortium, Massachusetts Institute of Technology.

Java is a registered trademark of Sun Microsystems, Inc.

JavaScript is a registered trademark of Sun Microsystems, Inc., used under license for technology invented and implemented by Netscape.

SAP, R/3, xApps, xApp, SAP NetWeaver, Duet, PartnerEdge, ByDesign, SAP Business ByDesign, and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP AG in Germany and in several other countries all over the world. All other product and service names mentioned are the trademarks of their respective companies. Data contained in this document serves informational purposes only. National product specifications may vary.

These materials are subject to change without notice. These materials are provided by SAP AG and its affiliated companies (“SAP Group”) for informational purposes only, without representation or warranty of any kind, and SAP Group shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP Group products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

This document was created using stylesheet 2006-12-31 (V5.1beta [= 6.0 for E3]) and XSLT processor SAXON 6.5.2 from Michael Kay (http://saxon.sf.net/), XSLT version 1.
Disclaimer
Some components of this product are based on Java™. Any code change in these components may cause unpredictable and severe malfunctions and is therefore expressly prohibited, as is any decompilation of these components. Any Java™ Source Code delivered with this product is only to be used by SAP’s Support Services and may not be modified or altered in any way.

Legal Software Terms

Terms for Included Open Source Software
This SAP software contains also the third party open source software products listed below. Note that for these third party products the following special terms and conditions shall apply.

1. **This software was developed using ANTLR.**

2. **SAP License Agreement for STLport**
   SAP License Agreement for STLPort between
   SAP Aktiengesellschaft
   Systems, Applications, Products in Data Processing
   Dietmar-Hopp-Allee 16
   69190 Waldorf, Germany
   (hereinafter: SAP)
   and
   you
   (hereinafter: Customer)
   a) Subject Matter of the Agreement
      A) SAP grants Customer a non-exclusive, non-transferable, royalty-free license to use the STLport.org C++ library (STLport) and its documentation without fee.
      B) By downloading, using, or copying STLPort or any portion thereof Customer agrees to abide by the intellectual property laws, and to all of the terms and conditions of this Agreement.
      C) The Customer may distribute binaries compiled with STLPort (whether original or modified) without any royalties or restrictions.
      D) Customer shall maintain the following copyright and permissions notices on STLport sources and its documentation unchanged: **Copyright 2001 SAP AG**
      E) The Customer may distribute original or modified STLPort sources, provided that:
         - The conditions indicated in the above permissions notice are met;
         - The following copyright notices are retained when present, and conditions provided in accompanying permission notices are met:
           - **Copyright 1994 Hewlett-Packard Company**
           - **Copyright 1996.97 Silicon Graphics Computer Systems Inc.**
           - **Copyright 1997 Moscow Center for SPARC Technology.**
           - **Copyright 1999,2000 Boris Fomitchev**
           - **Copyright 2001 SAP AG**

Permission to use, copy, modify, distribute and sell this software and its documentation for any purposes is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. Hewlett-Packard Company makes no representations about the suitability of this software for any purpose. It is provided “as is” without express or implied warranty.

Permission to use, copy, modify, distribute and sell this software and its documentation for any purpose is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that
copyright notice and this permission notice appear in supporting documentation. Silicon Graphics makes no representations about the suitability of this software for any purpose. It is provided “as is” without express or implied warranty.

Permission to use, copy, modify, distribute and sell this software and its documentation for any purposes is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. Moscow Center for SPARC makes no representations about the suitability of this software for any purpose. It is provided “as is” without express or implied warranty.

Boris Fomitchev makes no representations about the suitability of this software for any purpose. This material is provided “as is”, with absolutely no warranty expressed or implied. Any use is at your own risk. Permission to use or copy this software for any purpose is hereby granted without fee, provided the above notices are retained on all copies. Permission to modify the code and to distribute modified code is granted, provided the above notices are retained, and a notice that the code was modified is included with the above copyright notice.

Permission to use, copy, modify, distribute and sell this software and its documentation for any purposes is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. SAP makes no representations about the suitability of this software for any purpose. It is provided with a limited warranty and liability as set forth in the License Agreement distributed with this copy. SAP offers this liability and warranty obligations only towards its customers and only referring to its modifications.

b) Support and Maintenance
   SAP does not provide software maintenance for the STLport. Software maintenance of the STLport therefore shall be not included.
   All other services shall be charged according to the rates for services quoted in the SAP List of Prices and Conditions and shall be subject to a separate contract.

c) Exclusion of warranty
   As the STLport is transferred to the Customer on a loan basis and free of charge, SAP cannot guarantee that the STLport is error-free, without material defects or suitable for a specific application under third-party rights.
   Technical data, sales brochures, advertising text and quality descriptions produced by SAP do not indicate any assurance of particular attributes.

d) Limited Liability
   A) Irrespective of the legal reasons, SAP shall only be liable for damage, including unauthorized operation, if this (i) can be compensated under the Product Liability Act or (ii) if caused due to gross negligence or intent by SAP or (iii) if based on the failure of a guaranteed attribute.
   B) If SAP is liable for gross negligence or intent caused by employees who are neither agents or managerial employees of SAP, the total liability for such damage and a maximum limit on the scope of any such damage shall depend on the extent to which its occurrence ought to have anticipated by SAP when concluding the contract, due to the circumstances known to it at that point in time representing a typical transfer of the software.
   C) In the case of Art. 4.2 above, SAP shall not be liable for indirect damage, consequential damage caused by a defect or lost profit.
   D) SAP and the Customer agree that the typical foreseeable extent of damage shall under no circumstances exceed EUR 5,000.
   E) The Customer shall take adequate measures for the protection of data and programs, in particular by making backup copies at the minimum intervals recommended by SAP. SAP shall not be liable for the loss of data and its recovery, notwithstanding the other limitations of the present Art. 4 if this loss could have been avoided by observing this obligation.
   F) The exclusion or the limitation of claims in accordance with the present Art. 4 includes claims against employees or agents of SAP.

3. Adobe Document Services
Adobe, the Adobe logo, Acrobat, PostScript, and Reader are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries. For information on Third Party software delivered with Adobe document services and Adobe LiveCycle Designer, see SAP Note 854621.

**Documentation in the SAP Service Marketplace**

You can find this document at the following address: [https://service.sap.com/instguides](https://service.sap.com/instguides)
This page is intentionally left blank.